

# Education as a Factor of Work and Development of Agriculture

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## Abstract

Education is an important part of development, and the educational level of population is an inevitable indicator of the accomplished level of socio-economic development in each social community. This paper integrates numerous studies about the influence of education on agricultural development, in two aspects:

- 1) Social knowledge with a goal to develop and encourage new thoughts on the scientific importance for the development of agriculture and their contribution to the development, whereby education enlarges social involvement and influences the decrease of regional disproportion;
- 2) The influence of the educated level of farmers on their productivity (productivity of agricultural development).

The major challenge of the future is to accomplish the structural changes of agricultural development through a creative and synergic use of resources, primarily of all competitive knowledge.

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## Introduction

A long-lasting economic crisis and an uncertain future about the availability of food resources and products has caused great economic and social problems expressed by high indebtedness and structural imbalance which in turn encourage new ideas and knowledge

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about the scientific importance for the development of agriculture and its contribution to the development of other economy sectors, based on the conservation and use of natural resources as a need of future life and development.

Agriculture as the second development sector of the Republic of Serbia is invaluable for the nation (having a multiplicative effect on total economic growth and development) and the social stability of the Republic of Serbia, but it is also a big challenge for the rural population.

The current flow of transition and privatization failed to contribute to the strengthening of production and the market position of agriculture or to be responsible for an active adjustment to the process of global changes by building modern corporative managing, business and organizational culture based on knowledge and skills but through the implementation of education and science in agriculture. Therefore, an appropriate adjustment of strategies and goals of the creative [re]transition of agriculture by applying acquired and new competent knowledge has not been accomplished by showing interest for vocational education and specialization.

Education in the function of work or profession is a dominant need of agriculture. Due to this, in this research we wished to obtain a complete insight into the educational needs for vocational education and specialization, and also how the work content in agriculture determines educational needs.

Research results give a basis for making conclusions, although they at the same time open some new questions which request a comprehensive scientific elaboration.

## **The Multidimensionality of Education**

Modern trends of the market economy development have shown that science and education are the top priorities of global and national strategies and the politics of socio-economic and technical-technological development and progress.

This implies a creative and synergic use of resources, primarily competent knowledge which can be applied in different areas: transferable skills and knowledge, new multidisciplinary visions and transdisciplinary competencies through an expression of interest for vocational education and specialization.

Human and social capital together constitute intellectual capital which, with knowledge, skills and total behavior creates and practically uses all other resources (Pejanović, 2013, p. 503) There are three positions of encountering, educating and work content of work: the quality of the education effect; the quality of the “internal” components of education directed at the development of a certain work level; work understood as a goal and as an area towards which education inclines.

Knowledge gained by education changes its status, as it merges with its subject and thus “reflexively reconstructs” it. “Reflexive modernization” implies that nothing can be known for sure. “Workers of knowledge” (Adiges I) today are the most important and most endangered factor in economy. Education has for a task to enable individual economy and to be its social and cultural agent. Individualization is manifested on at least three levels: the levels of ideas, identity and institution. On an innovation wave based on new education quality, economic entities turn towards the future by encouraging the competitiveness of flexibility, mobility and diversity, which implies coordinating values with new global and local conditions and circumstances. The road to developed society requests “quality education for all”.

## Theoretical research

The goals of agricultural transformation should be observed through a larger production, market competitiveness, larger export, larger productivity and profit, as Serbia has resource developmental preconditions for agricultural production. Those goals can be accomplished through organizing modern agricultural production for which knowledge and information is necessary, as well as good technical equipment and a profiled organization and connectivity in the agro industrial system. Knowledge economy is major tool in the direction of the new model of economic and social growth and development (Pejanović, 2013, p. 622)

Economic literature, there is a convincing argument about the role of education in agriculture, as it is undeniable that education raises the level of knowledge, intellectual skills, as well as helping people in finding their own identities and choice of lifestyle. Education to a large extent increases practical competencies and helps develop skills, a rational approach to problems and a future orientation. Also, educated people are more open toward new ideas and new experiences and at the same time, they are more independent and have more self-confidence. However, it must be admitted that even research in social sciences has provided a set of convincing hypothesis related to 'intervening variables' which are used to explain the correlation between education, agricultural and economic development, as the direct implications of such a research are not obvious. Also, in practical appliance, the results of research are used selectively. Most of the assessments of the influence of education on work productivity use the level of wages as a stand-in for marginal productivity and question the influence of the educational level of the individual with help of other controlled variables, due to which an individual's education can indicate the existing of productive performances.

Along with examining the impact of education on productivity, also under analysis is the influence on allocative efficiency, or in other words, the extent to which agricultural organizations are optimally choosing their mix of inputs and outputs in the light of their production functions and dominant prices. Allocative efficiency is being considered by comparing real and optimal allocation in the light of the estimated production function and an assessment of profit and demand factor functions in order to test allocative efficiency.

The primary method of analysis which has been used in studies is divisively regressive with both variables, both dependent and independent in logarithmic form, mostly known in economic literature as the Cobb-Douglas type.

Research has shown that an average production profit for four years of education is about 8.7%, with a standard deviation up to 9.0%. As can be noticed, the aspect of the environment can be an important determinant of the influence of the effects of education on production. Specific education is mostly more efficient within the circumstances of modernization.

In all the studies analyzed, the average increase in production within four years of education in traditional circumstances is 1.3% compared with 9.5% of increase in modernized cotemporary conditions.

The other method of assessing the impact of modernized environment on the productivity of education is to perform a progressive analysis of our assessment of the percentage increase in agricultural production after four years of completed education, as a function of indicators such are the level of literacy in the country, modernization of

environment, regional availability of advisory services, types of crops and the gross domestic product (GDP) per capita.

Practice confirms that the variable of environment modernization is very significant. In average, the percentage profit as a result of four years of education has been 10% greater in modern environments than in traditional ones.

Formal education is in its essence complementary by nature with less formal systems which combine such vocational abilities with many former educational strategies, which is a consequence of their overlooking the existence of a highly efficient educational structure. Formal education is mostly concerned with literacy, calculation and general education in which basic “abilities to learn” are being generated, but informal education is of a vital importance in innovative agricultural processes.

It is likely that, however widely we cover the existing literature which deals with the role of education, it would be insufficient. Nevertheless, this modestly presented insight into literature shows and proves the quantity of roles and channels by which and through which education influences agricultural development, taking into consideration the values, abilities, knowledge, habits, competence, and skills of those employed in agriculture. We conclude the theoretical part of this paper with the words of Jacques Delors: “Lifelong education represents the key which opens the door of the 21<sup>st</sup> century” (Delors, 1996, p. 99).

## Methodology of empirical research

Theoretical research provides a rather clear picture of our subject of research. The subject of research includes determining the interdependence of education and content of work of those employed in an agricultural organization (hereinafter: agriculture), that is to say, between the educational behavior of employees and the content of work (on the level of a specific work organization) and the responsibilities which employees perform during the work process (on the level of their profession and business activity): direct perpetrators of agricultural labor, direct managers and engineers – technical staff, higher executives and experts, scientists and administrative personnel. Such an approach to the subject of research provides the capability to gain a relevant image about the real influence of education on work contents and the necessity for education and specialization.

In research, we start from the basic hypothesis: *there is a positive correlation between education and the attitude toward education and certain elements of work contents in agribusiness.*

*Independent variables* in our research are the following: work motivation, level of work organization satisfaction, satisfaction of specific work, work creativity, the level of knowledge implementation in an organization, possibilities of professional specialization and career advancement, the functionality of educational (school) knowledge, the prospects for education within an organization.

*Dependent variables* have been examined through the scale of attitudes toward education and a questionnaire for measuring motives, desires, interests and needs regarding education.

## Sample

There were a total of 147 employees questioned.

I – features of work contents:

98 – *manual work force in agriculture or 65.7% employees;*

19 – *direct managers and engineering-technical staff (12.7%);*

13 – *higher executives and experts (8.3%);*

12 – *administration personnel (8%);*

8 – *scientists (5.3%).*

II – education:

23 *employees with an incomplete elementary school education (15.4%);*

47 *graduated elementary school employees (31.5%);*

43 *graduated high school employees (28.8%);*

8 *college graduated employees (5.4%);*

19 *faculty graduated employees (12.7%);*

4 *MAAs (2.7%);*

5 *PhDs (3.5%).*

III – gender:

107 – *males (71.8%) and*

42 – *females (28.2%).*

*Respondents have been tested individually and in smaller groups, mostly at the work place.*

## Research methods

Within this paper, we strive to establish a ‘balance’ of the deductive and inductive approaches to the subject of research, convinced that only in such a way we can avoid certain ambiguities, and we have provided a space for an overall insight of perceptions and behaviors of employees about contribution of work education and results of work within agricultural organizations; thereby - its empirical verification.

## Research results and discussion

### After-work activities of employees in agriculture, and the place of education in those activities.

We observed that highest number of manual workers in agriculture commit their after work time to domestic and family obligations (51%), sport and recreation (15,6%), visiting bars and restaurants (12.5%), but also the same percentage is dedicated to watching television, reading newspaper (5.2%), while no time at all is dedicated to learning, education and library visits.

Therefore, agricultural manual workers are not involved with education as a spare-time activity.

In that regard, scientists differ hugely from manual workers. For example, 36.8% scientists chose studying and education as a spare-time activity; higher executives and experts 8.9%; immediate executives and engineers - technical stuff 8.4%; administrative personnel 2.5%.

## **Motives of employees for participating in education**

The issue of motives for education of the employees has often been explored both in domestic and foreign literature. Research results point out certain differences regarding motives. Most researches point out that on the top of the motivation list is an increase of personal salaries (25.2%), followed by a „better work place” (21.8%) and a “desire to gather new knowledge” (15.8%).

The gathered research results of our investigation about motivation of employees in agriculture for participation in education confirm the previous studies, but the motivation percentages differ, therefore:

- The most common motivation is a better work place - 45.4%;
- Personal incomes motivates participation in education - 41.2%;
- 3.1% is equally occupied by vocational education, creative work, reputation, social status, and
- 1% has a desire to expand their education.

The desire for vocational education is often beyond institutions of education as employees in agriculture, when it comes to expanding their expertise, mostly rely on their own personal experience: reading books and professional journals, as well as personal contact with those who can be helpful in that regard.

## **Interdependency of work in agriculture and education**

### ***a) Participation of education within work contents in agriculture***

The presence or absence of educational knowledge and skills in performing (content) jobs (work) of those employed in agriculture is highly dependent on satisfying educational needs and the participation of employees in educational activities. Based on the research results of investigation, it can be concluded that elementary education and professional training for the work place participates with 33.3%, retraining education follows with 25%, and 8.3% amounts for vocational specialization, while social – economical education, foreign languages courses and specializations are not particularly interesting for those who work in agriculture.

The low percentage of manual workers in agriculture who participate in educational activities is in accordance with our expectations because of the nature of their line of work, but the data which is surprising is that higher executives and experts participate in educational activities only with 6.1%, which is most likely conditioned by the line of work of the staff and their inclination to search for professional literature and vocational education abroad.

At the same time, manual workers are included in educational programs for retraining with 25%, while they had no participation in foreign language courses.

**b) Motivation of employees for education** (*highly motivated, motivated, not motivated at all*):

Only 9.2% of the respondents is **highly motivated** for education which is in accordance with their needs for retraining work program together with 16.3% who are **motivated** by the same reasons, while there are 34.7% moderately motivated, but in the same way and in the same percentage, 5.1% **are not motivated at all** for any sort of education which can be the consequence of certain factors such as age, employment status, etc.

**c) The level of application of knowledge gathered through education** (*sufficient, moderate, and none*):

Education is an important factor of work productivity and economic success, which is of a great importance for agricultural development, and which is also the reason that we placed that variable in connection with the work contents of employees in agriculture.

The feedback from respondents regarding using school knowledge: sufficient - 8.2% moderate - 33.7%, and not at all - 58.1%. These results are troubling but at the same time they are expected, considering the educational structure.

**d) Opinions of the employees on the contribution of knowledge and education to the economic success of their organization:** (*very high contribution, high contribution, moderate contribution, low contribution, no contribution at all*).

Results show that employees are assigned great value to the contribution of knowledge and education to the economic success of the organization: 20.5% very high contribution, 40.8% high contribution, 34.7% moderate contribution, 2% low contribution and 2% no contribution at all.

The results are not surprising, but it is difficult to say whether they are the consequence of work content, the level of education of the respondents or some other factors.

**e) The assessment of the functionality of knowledge gathered during education:**

The problem of the functionality of knowledge gathered during education is a serious one, because it is evident that neither the economy nor the educational institutions are satisfied with the degree of applicability of knowledge gathered during education. Through research we have tried to gain an insight into this problem, using the perception of employees in agriculture on the functionality of knowledge gathered during school. Manual workers in agriculture very negatively assess the applicability of school knowledge at work: 1% - very highly, 0% - highly, 23.7% moderately, 33% low and 42.3 % not applicable at all, which is in correlation with their level of education. However, there are big differences caused by the work content of the employees, meaning between professional **categories**. Related to the manual work force in agriculture whose negative perceptions we presented, the most positive attitude toward the functionality of acquired knowledge have been shown by scientists working in agriculture - 71.4%, while a relatively moderate percentage have the same opinion (managers and engineers – technical staff) 9.9%, high executives and experts 15.2% and administrative personnel 5.1%, etc.

Even different interpretations of these results are possible, and it seems that greater criticism toward this problem is expressed by professional groups which need practical knowledge which our education does not provide sufficiently by connecting theory and practice.

The following conclusion is that the gap between the ‘world of work’ in agriculture and the “world of education” is large and based on those and previous results of the research it can be said that it is insurmountable.

***f) Willingness of the organization to use employees’ knowledge and skills:***

The indicator of willingness of the working environment and the organization to encourage education and the ability of employees is a significant motivational factor of interest for education and contribution of knowledge and education to the economic success of growth and development of an organization. Based on determined statistic indicators, or based on processed answers of respondents, we can conclude that respondents’ subjective assessment of willingness of organization to use knowledge and skills of their employees depends on the employees’ work content. Almost two thirds of the results are gathered around the medium variable pole – moderate (67.7%), and toward the negative variable pole – not at all (15.6%), and sufficient – 16.7% of the respondents. About the willingness of organization to use knowledge and skills of the employees most critical are manual workers in agriculture – 28.9% and direct managers and engineer – technical staff (25.8%). An explanation of this result can be the fact established by research that agricultural knowledge and education are less valued in this business than by other organizations.

## **Concluding Remarks and Possible Directions of Future Research**

The quality of work, growth and development of agricultural organization is the result of the quality of the education of employees, or the result of their knowledge, understanding, habits, skills, abilities and production as well as esthetic and ethical values.

Education and learning can improve changes in work contents and work activities, encourage and speed up work improvement with new methods and techniques and contribute very much to improvement of abilities and creativity.

This influence slightly decreases when take under consideration the age and educational level, where older respondents have generally more negative attitude toward education than the younger employees, while employees with a higher level of education have a more positive attitude about the contribution of education to the content of work related to employees with a lower education level.

Research determines the order of motivation for education with employees in agriculture: increase of personal incomes; a better work place; desire for vocational specialization and a desire for exploring knowledge.

The assumption that work contents is a variable significantly related to choice of motivation for being included in educational activities is confirmed. Manual workers in agriculture are mostly preoccupied by motivations of a utilitarian character.

The research results to a large extent confirm the results of domestic and foreign authors related to the interest of employees in agriculture for certain types of education, and that the content of work is an opting variable of employee preferences in the area of acquiring knowledge. At the same time, this means that it would be desirable for researchers to associate this problematic with the content of work, as a stimulating factor for education in a wider environment, meaning a socio-cultural environment but with intellectual and psychological characteristics of employees in agriculture.



During the determining of areas and contents of education, the practical requests of work and working situations of employees must be taken under consideration. It is expected, for example, that manual workers in agriculture have a direct interest to acquire elementary education, professional training for the work place and retraining, while a smaller number of employees is interested in programs which have wider professional knowledge, which is mostly characteristic of other professional groups in agricultural organizations.

Agriculture needs something else than what we have today – a wider opening to science and education for new innovative programs with clearly defined quality criteria. The awareness on interactive connections of socio – economic development and education must be built.

Large and far-reaching changes in the structure and content of work and work activity based on automatization and high technologies, intellectual contents and rational and innovative activities strongly promote the need for continuous learning and education and interest for different dimensions of professional and total development of human society and values.

We expect that the given research results and proposals and suggestions would help theoreticians and practitioners in the area of education for agriculture to create educational work with employees. The question which remains open and is very interesting for further research is the following: **Do the respondents perceive the acquiring of new knowledge as being imposed, or as a personal choice and the possibility to improve certain aspects of work content, as well as improving the quality of their lives?**

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