

Analysis of Educational Needs – Starting Point for Identifying the Needs of Further Professional Education in Businesses

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Abstract. The practice of advanced economies confirms that permanent education is becoming an area of priority interest, and it is also an important part of the care of the quality of employees. An employee's work performance depends on the qualifications completed and personality properties, abilities and skills. The paper deals with the stage of analysis of educational needs as the basis of their identification. We paid a special attention to data collection, the quality of which determines the analysis of educational needs and secures a successful implementation of education. The scope of forms of education is not fully examined. In this paper we analyze education of individuals and team education and its impacts on the results and fulfilment of objectives set forth by employees. We also analyzed impacts on knowledge and knowledge and skills of employees, which are investigated on the basis of employee evaluation. The aim of our paper is, based on the application of MS Excel program and the statistical program PSPP Statistical Analysis Software, to evaluate benefits of individual and team employee education and propose the aims of education for which team and individual employee education is effective. Within the research project KEGA No. 014EU-4/2016 "Preparation of the content and structure of subject disciplines focused on the development of knowledge and skills of graduates from non-economic health service fields of study", we analyse a process aspect of further education also in organizations of other industries in terms of their benefits and needs for achieving business objectives.

Keywords: Educational Needs, Employee Performance, Individual Education and Training, Team Training.

1 Introduction

Dynamics of economic development and rising and demands on the work performance are placing education in the position of not only a systemic but also a continuous process. Employees have to ensure their lifelong employability, but likewise management of most businesses and non-business entities, regardless their size (in terms of the turnover and number of employees). It is frequently required to

acquire knowledge and skills from other fields of science, which promotes an interdisciplinary approach to education. Nowadays employee education is considered an efficient means of differing from other organisations and achieving success in competition. Human resources are a driving force in an organization; they set in motion other resources and decide about the organization's competitiveness. These are the most expensive and most risky sources; consequently, they require special treatment and conditions, so that they were able to create required performance. Human resources consist of individuals, who search for the possibilities of self-actualisation and are motivated by personal needs, interests and ambitions. Their quality and utilisation depend from the organization's management [13].

In each organization, there are numerous rules and procedures, which employees need to learn to be able to perform their work effectively. Education is becoming the factor by means of which organizations to ensure the growth of performance and the increase in quality. At the same time, it enables them to raise the attraction of an organization on the labour market. For education to be effective it has to be planned. The plan of education and training is one of the most important tools of managing human resource development. In this way, management of organizations ensure the consistence with the employee qualification structure. By means of planning process, businesses can decide on the employees, areas and scope of activities and the price for which they are willing to educate. Before the preparation of the plan, it is necessary to analyze educational needs and assess whether the educational process is necessary. The identification of educational needs is an inevitable part of a systemic approach to education, and a prerequisite for the employee education of the business to be organized, meaningful, and efficient. Within the research project KEGA No. 014EU-4/2016 "Preparation of the content and structure of subject disciplines focused on the development of knowledge and skills of graduates from non-economic health service fields of study", we explored education not only in terms of the process, but we also studied links between education and employment and human resource development. In the present paper, we deal with the analysis of educational needs, which is the basic starting-point for identifying needs of further education in businesses in accordance with the principles of the 2020 Education Strategy [2].

Qualified human resources are becoming an important source of organization's success. If the organization perceives them as an asset (source), which brings economic benefits, investments in education are considered the most significant investment in the corporate capital [9].

2 Theoretical Starting Points of Analysis

Educational needs are not primary needs of humans; instead, they arise in life and are influenced by various factors [13], most often related to the realization of work activities. The emergence of learning needs begins:

- In the case of claims placed on an individual in employment (these requirements are changing and evolving in connection with increasing work requirements);

- In connection with variable requirements of the job and the tasks to be performed;
- By implementing organizational changes, change in jobs or creating new jobs;
- By implementing new career functions in relation to career growth;
- By means of various factors influencing the job performance.

Educational needs are not human primary needs, they arise in the course of one's life and are affected by various factors [13]. Most frequently, they are connected with the performance of work activities. Educational needs arise in the context of:

- Dynamic conditions of economic development in connection with rising requirements on the work performance;
- Changing conditions of the workplace and tasks to be fulfilled;
- Implementation of organizational changes and changes in places of work;
- Creating new jobs;
- Performing new work functions related to career growth;
- Various forms of the job performance, etc.[13]

These factors influence the need for educating individuals, developing their abilities of coping with changing conditions of the workplace and demands of the work performance and requirements of work results. Formal education is therefore viewed as the preparation for further professional education, which is either provided by the individuals themselves according to their ideas and career interests, or it is organized and financed by the organization in which employees work.

Apart from the education and training tailor-made for the needs of individuals, which is implemented in a classic attendance form, in further education there is preferred trend to pass from the dominant role of the lecturer/instructor to that of learners (participants). It is increasingly more required to include education in everyday activities rather than provide it from time to time at planned educational activities. Action learning is immediately related to the place of work and is accompanied with identifying work problems, proposing alternative solutions, and testing variants of solutions (options), while at the same time considering the consequences. Finally, the most suitable option in real-life situations is selected. This method is a progressive and efficient education. A modified form of action learning is team learning, through which teams generate knowledge by harmonizing and developing experience and abilities of team members' abilities. Team is a basic learning unit of an organization. Team learning focuses on the ability of mutual learning, which brings higher quality and outputs from training, in contrast to the training of individuals.

Education is an area that is at the centre of decision-making sphere, which directly implements specific activities and it via institutions issues calls for submitting projects for experts specializing in particular research activities. An important project dealing with the issues of analysis and identification of educational needs was VEGA project No. 1/0598/08 "Theoretical and methodology framework of analysis into adult educational needs", tackled at the Department of Andragogy, Faculty of Education, Matej Bel University in Banská Bystrica. The aim and essence of the project was to systematize theoretical findings on the analysis of educational needs and based on that, arrive at theoretical andragogic starting-points of identifying educational needs of a learning individual, groups and society. Another inspiring pillar related to part of

the research described in the present paper is the research project VEGA No. 1/0386/11 “Processes of institutionalisation of adult education in Slovakia”, elaborated at the Department of Andragogy, Faculty of Arts, Comenius University in Bratislava, in which comparative findings on not only implementation of education in Slovakia but also abroad. Likewise, an important role is played by experience and results of projects of nationwide and international projects. An important role is played by the Slovak Academic Association for International Cooperation with its major projects under the programme of Erasmus plus for education, vocational training, youth and sports for the period of 2014 – 2020. It is necessary to mention here grants solved under GRUNDTVIG and Comenius programmes, lifelong learning concepts presented by OECD [4], activities organized by UNESCO, in particular, the Sixth World Conference of Adult Education VI, the conclusions of which address also educational target groups and concern their educational needs [17].

Before providing education and training, it is important to determine educational objectives and design the programme of education based on these objectives. Before objectives may be determined, it is necessary to identify educational needs. These needs can be identified based on the implementation of the following two stages, namely preparatory stage – data collection and analysis of acquired information [19].

The preparatory stage of educational needs analysis therefore starts with the selection of sources for acquiring data. Subsequently, data are accumulated about abilities, knowledge, and performance of an individual, as well as the information about working activities and the strategy of the business. There are several information sources, which enable us to identify priorities of education [1]. They include:

- Business objectives and business plans, which indicate the direction of the development of the business and indirectly determine its priorities in education.
- Planning human resources and succession which, provide information about the future structure of employees and needs for managerial education.
- Personnel statistics, i.e. statistics describing movements of human resources.
- Interviews with leaving employees, which might also refer to problems related to education in the business.
- Consultations with top level managers, who perform essential decisions and are entitled to formulate qualification requirements on employees and managers.
- Data on productivity and quality of work, which point to differences between the expected and real results and reveal negative impacts.
- Changes in the organization structure that reveal the need for qualification preparation.
- Demands placed on managerial education resulting from their perceived needs.
- Information from financial plans about funding options for education.
- Plans for introducing new techniques and technologies or systems based on information technologies and requirements of new knowledge and skills.
- Marketing plans and ensuing requirements related to employee knowledge.

- Surveys of employee opinions.

Analysis of educational and training needs is implemented based on freely available information in the employer entity (containing information from employee appraisals, inspections, meetings, discussions, absences, from the assessment of utilisation of work time, etc.) and the information collected for the purpose by means of various methods (interview, observation, questionnaire, work samples, and the like).

There are available several methods of collecting data, for instance, structured interview, observation, questionnaire survey, participation, group discussion, job descriptions developed by employees, analysis of critical event, 360 degree feedback, motivation–assessment interview, assessment centres (hereinafter AC), various types of tests (e.g. psychological tests in some tasks), self-assessment, and the like [10, 20, 16, 7]. Their implementation in practice is discussed in the empirical part of the paper.

Educational needs in individual businesses are explored:

- in the business as a whole, i.e. as corporate needs;
- in teams, functions, professions, i.e. as group needs;
- for individual employees, i.e. as personal needs.

Analysis of education and training can start from individual needs towards group and corporate needs; however, the entire process may be directed in the opposite direction: corporate needs are analyzed, which is then followed by the analysis of the needs of various units or jobs performed by individuals.

A specific aim of the human resource strategy development is developing educated and qualified individuals, professional and quality teams representing the entire organization. The required structure of human resources necessitates to develop the culture of education and environment, in which employees are supported and motivated to educate themselves. There are also supported team education activities, focused on systemic knowledge management [5]. The priority is integrating education and training into the strategy and development of the system of education, and designing the system of education. The latter will contribute to increasing the productivity of labour and improving the work performance, increase in qualification, knowledge and abilities of employees, improving interpersonal relations at workplace, and ensuring the growth in the organization's competitiveness on the market [3].

British and American authors deal with various aspects of employee development [15, 8]. For instance, Laird et al. [8] survey methods, functions, and goals of training, ranging from educational needs assessment to the implementation, Schneier et al. recommend how to gain commitment, assess needs and choose suitable methods of training and its evaluation. It is emphasized that employee training is an investment rather than an expense for the company and explain that these programs increase employee loyalty and list various ways and types of employee training programs, e.g. on-the job training, off-the-job training and electronic training; orientation training, job description training, upgradation, traineeship training. [11]

3 Aim and Methods of Research

The theoretical part of the article is an excerpt of data from domestic and foreign scientific and professional sources related to the needs of empirical research. In the present paper, we deal with the importance of individual steps leading to the identification of educational needs in businesses. We pay a special attention to data collection, which is the basis of the entire analysis of educational needs. The frequency of applying methods of data collection in businesses will be presented in the research sample in results of empirical research.

The aim of the research was to describe the process of identifying educational needs as a significant stage of the systemic approach of further professional education in businesses. The starting point was the intention of further professional education to achieve a higher performance and better work results and increase knowledge and skills so that tasks set forth could be fulfilled in the best possible way. We were interested in the dependency of employee work results on the education and training of individuals and on team education and training and in the dependency of the assessment of knowledge and skills on education and training of individuals and teams.

Based on these considerations, research hypotheses were established. Each hypothesis testing is aimed at verifying the underlying hypothesis, the so-called zero hypothesis – H_0 . Compared to zero hypotheses, we determined alternative hypotheses H_1 . (H_0 = zero dependency between variables, H_1 = dependency between variables). If, based on testing hypotheses, we refuse the zero hypothesis, we accept an alternative hypothesis. The alternative hypothesis says what is valid if the zero hypothesis does not apply. [12].

Research hypotheses were determined as follows:

Hypothesis No. 1:

H_0 = Results of employee work performance (EWP) do not depend on the time of the education and training of individuals (IET).

H_0 = Results of employee work performance (EWP) do not depend on the time of team training (action learning – AL).

H_1 = Results of employee work performance (EWP) depend on the time of individual education and training (IET).

H_1 = Results of employee work performance (EWP) depend on the time of team training (action learning – AL).

Hypothesis No. 2:

H_0 = Assessment of knowledge and skills (AKS) does not depend on the time of education and training of individuals (IET).

H_0 = Assessment of knowledge and skills (AKS) does not depend on the time of team training (action learning – AL).

H_1 = Assessment of knowledge and skills (AKS) depends on the time of education and training of individuals (IET).

H₁ = Assessment of knowledge and skills (AKS) depends on the time of team training (Action Learning – AL).

In our hypotheses, we chose a double zero and an alternative hypothesis to be able to accept a validated hypothesis after hypothesis testing. Time of education and training is to be understood as the number of hours during which employees are involved in education and training during the period of one month. Time of education was separately examined for individual education and training on the one hand and team education on the other hand.

The research was conducted by means of the interview and questionnaire methods. The interview was applied to gain a better understanding of respondents' opinions and experience. Interviews were conducted in the pre-research and in designing the questionnaire. Primary data collection was based on questions in the questionnaire designed. Questionnaires were distributed in person or online.

For the realization of the research, opinions from 287 respondents (from the originally addressed 360 respondents) were taken into consideration. This accounts for a 79.72% rate of return, which can be considered a success. For the purpose of this research, the number of respondents was calculated on the basis of the number of employees in divisions explored of C – section: Industrial production, at the calculated level of reliability of 95 % and 6% tolerance. The aim was to ensure that the number of respondents enabled to generalize of the information received and provide proposals for improving the learning process in their businesses. In terms of size, representation of respondents was as follows: respondents from large corporate entities – 112 respondents; respondents from medium-sized corporate entities – 88 respondents; respondents from small corporate entities – 87 respondents.

In each group of businesses by size, 120 respondents were addressed. The greatest interest in participating in the research was recorded in large businesses, while in medium-sized and small businesses we observed some apprehension of being engaged in the research. Respondents who were addressed, i.e. those who made the assessment, were personnel managers and line managers or owners, mostly in small enterprises. Respondents were managers working in various managerial levels, i.e. the line, medium, and top management levels. In the case of small businesses, respondents were owners. Respondents represented a research sample of C– section: Industrial production, according to Statistical Classification of Economic Activities SK NACE Rev. 2 pursuant to Decree No. 306/2007.

The following are the divisions from which respondents were chosen:

- 10 – Foodstuffs
- 11 – Beverages
- 12 – Tobacco Products
- 14 – Clothing
- 15 – Leather and leather products
- 16 – Wood processing and wooden and cork articles, except furniture, straw and wicker products
- 17 – Paper and paper products
- 20 – Chemicals and chemical products

- 21 – Basic pharmaceutical products and pharmaceutical preparations
- 22 – Rubber and plastic products
- 29 – Motor vehicles, semi-trailers and trailers
- 31 – Furniture.

Individual respondents form the statistical units, and their opinions are the basis for the application of selected statistical methods. Apart from indicating the percentage of each method applied in the process of data collection in businesses analyzed, we explored mutual linear dependencies between selected variables.

Two types of methods were used for processing the data collected: Manual processing, where the bar code method was applied, and automated processing: the data collected were analyzed in MS Excel [6] and in the statistical program PSPP Statistical Analysis Software. The results of the statistical processing will be presented in statistical surveys in tables and interpreted verbally. The hypotheses are tested by regression analysis.

4 Research Results

In the course of research, we started from the fact that employees are important assets, who secure not only the very existence of businesses, but also their competitiveness. Employees are those who know best their workplace and are able to disclose the entire place where manifestations of ineffective behaviour arise. They are able to submit proposals for improving existing processes and procedures. They need to be adequately trained for this purpose, which is connected with the preparation of special-purpose educational activities. If education is to be tailor-made, educational needs of individuals have to be identified. Identification of educational needs starts with acquiring information and their analysis. Information may be classified into:

- Freely available information within businesses (information in business plans, internal statistics, information from employee appraisals, inspections, and worked-out performance tables, personnel audits, etc.);
- Information acquired for this special purpose by means of various methods (structured interview, questionnaire/assessment survey, tests for employees, workshops, self-assessment, etc.), which we analyzed in empirical research.

Table 1. Methods of special-purpose data collection for analysis and identification of educational needs

Methods and techniques of data collection	Small businesses (87)	Medium-sized businesses (88)	Large businesses (112)
Structure interview	2	12	86
Observation	5	29	105
Questionnaire survey	-	3	42
Participation	32	12	27
Group discussions	3	9	39

Job descriptions created by an employee	17	11	24
Critical event analysis	9	23	87
360-degree feedback	83	85	112
Motivating evaluation interview	69	84	109
Assessment centres	1	52	112

Each method and technique of data collection was monitored separately, since businesses use combinations of data collection methods and techniques. The methods listed were applied only in the case of individual education and training of employees. However, 72% respondents (of 287) indicated that methods and techniques of data collection were applied, but the subsequent systemic analysis of data, which would really indicate the areas in which employees should be trained was neglected. The identification of educational needs in majority of analyzed businesses is not the starting point for designing education and training. Participation of employees in education and training is influenced by numerous factors, including the offer of educational activities, preferences of line managers (or immediate superiors), by the interest of employees themselves, and by making education and training consistent with career plans. Important factors in team education and training include the current situation at workplace, problems arisen, employees' interests, and managers' intentions concerning the future of a section/department.

Table 2. Dependency of employee work results on education and training of individuals and on team training

	Employee work results	
	Spearman's Corr. Coeff.	Sig. (2-tailed)
Team education and training (AL)	0.208	0.000
Individual education and training (IET)	0.345	0.000

The relation between employee work results and education and training of individuals and team training is a statistically significant relation. Employee work results are in the medium strong correlation dependency with the education and training of individuals ($r = 0.345$; $\delta = 0,000$) and in a weak correlation dependency of team training ($r = 0.208$; $\delta = 0.000$).

Table 3. Regression analysis of the influence of individual education and training and team training on employee work results

Model ((a. Dependent Variable: PVZ)	Unstandardized Coefficients		Std. Error	Sig.
	B			
Constant	3,064		,098	0,000
Team education and training (AL)	-,048		,042	0,246
Individual education and training and training (IET)	,339		,055	0,000

In the course of research, we were interested whether the fulfilment of the employee work results (EWR) (meeting work objectives, increase in quality, and the like) are dependent on the education and training of individuals and on that of teams. The regression analysis result is the following equation:

$$EWR = 3.064 - 0.048 \times AL + 0.339 \times IET \quad (1)$$

In team education and training, sigma is high ($\delta=0.246$), i.e. – there is not a statistically significant relation towards employee work results. Individual education and training markedly predetermines employee work results as the equation shows:

$$EWR = 3.064 + 0.339 \times IET \quad (2)$$

If the time of individual education and training increases, by one unit, employee work results rise 0.339-times, after considering also a calculated constant 3.064. Employee work results are dependent on individual education and training. Based on the analysis, the alternative hypothesis is accepted: H_1 = Employee work results (EWR) are dependent on the time of individual education and training (IET).

Table 4. Dependency of assessment of knowledge and skills and education and training of individuals and teams

	Assessment of knowledge and skills	
	Spearman's Corr. Coeff.	Sig. (2-tailed)
Team education and training (AL)	0.367	0.000
Individual education and training (IET)	0.460	0.000

Based on correlation coefficients calculated, the assessment of knowledge and skills in a medium correlation dependency of individual education and training ($r = 0.460$; $\delta = 0.000$), as well as by team education and training ($r = 0.367$; $\delta = 0.000$). This dependency will be further explored by means of regression analysis.

Table 5. Regression analysis of influence of individual education and team education and training on the assessment of knowledge and skills

Model (a. Dependent Variable: AKS)	Unstandardized Coefficients		
	B	Std. Error	Sig.
(Constant)	3.024	0.098	0.000
Team education and training (AL)	0.062	0.042	0.140
Individual education and training (IET)	0.321	0.055	0.000

On the basis of empirical results we intended to establish if the assessment of knowledge and skills (AKS) depends or does not depend on the time of individual education and training (IET) and the time of team training (action learning – AL). For this purpose, hypothesis 2 was formulated, in which both zero hypothesis and an alternative hypothesis were doubled. Based on calculations, the equation may be written as follows:

$$AKS = 3.024 + 0.062 \times AL + 0.321 \times IET \quad (3)$$

In the case of team education and training sigma is high ($\delta = 0.140$), which means that team education and training is not statistically significant to dependent variable. Assessment of knowledge and skills is dependent on individual education and training, after consideration of calculated constant amounting to 3.024 according to the equation:

$$AKS = 3.024 + 0.321 \times IET \quad (4)$$

This means that if we increase individual education and training by one unit, assessment of knowledge and skills increases 0.321-times, after consideration of the constant. Based on the analysis and calculations, it is possible to accept the alternative hypothesis: H_1 = Assessment of Knowledge and Skills (AKS) is dependent on the time of individual education and training (IET).

Employee work results as well as results of knowledge and skills assessment are dependent on education and training of individuals. The basic starting point for preparing an effective project of education and training should be the identification of educational needs. However, this is not fully conducted in many businesses, as the research conducted indicated.

5 Conclusion

Development of opinions of education is closely connected with conditions and development of society. It is also crucial how individual businesses adjust their approaches to employee education. There are several reasons which should influence the decision making process in the area of education in businesses:

- Both business and non-business entities have to integrate new findings and technologies in their activities to be able to compete in demanding market conditions [9].

- Existing changes on the market in customer behaviour, or competitors necessitate the ability of reacting pro-actively.
- Frequent organizational changes are also a fact to which it is necessary to adjust. Their impacts are most markedly manifested in human resources.
- A more distinct orientation to quality and its preference to quantity.
- Globalization and internationalisation, which are the reasons for expanding the market, enlarging competitive environment and the necessity to communicate in international environment.
- Efforts for stabilization and maintenance of quality qualified human resources.

Development of knowledge-based society shifts team education to the forefront. Team education and training is a modification of action learning and it is a basis of establishing learning organizations. These organizations are characteristic of systemic behaviour and a free access to information and continuous internal qualification growth. Basic units of learning should be teams rather than individuals. However, research results showed the very reverse: it was individual employees who constituted basic units of education in businesses. Their work results and level of assessment of knowledge and skills is an impulse for supporting education. Data collection for purposes of analysis and identification of educational needs is linked to education and training of individuals.

When applying statistical methods, the research hypotheses were corroborated or defied, and at the same time we verified conclusions of the research project VEGA No. 1/0386/11 "Processes of Institutionalisation of Adult Education in Slovakia", which was solved at the Department of Andragogy, Faculty of Philosophy, Comenius University in Bratislava. In this project education of individuals is preferred to that of teams. Despite a careful application of data collection methods and procedures for the purpose of analyzing and identifying educational needs, we can state based on the research conducted that a complex analysis poses problems in majority of businesses, while the application of methods, procedures and ways of their implementation is missing.

Despite the fact that there have been worked out (in theory) various methods that could be used in businesses in the process of analysis, these methods are not applied in the practice of businesses. Many respondents indicated they had inadequate knowledge and experience in their applications. This leads to an informative character of data collection, while the identifying of educational needs and designing educational plans and educational activities are often based on other factors, for instance current interests of employees and managers, or on trends in the education sciences and human resource development conceptions, as well as on developments on the labour market [14].

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