1. MOTIVATION

The European Employment Strategy sums up political developments in united Europe and puts stress on the employability of wide range of population groups. This is possible only with high quality of professional qualifications. High level of staff qualification leads to increased intensity of education and training needs. Political will is accompanied by real world needs. Social development where one may see increasing urbanization; changes in employment culture; range extension of employment; increasing share of working women; extension of part time jobs and length of professional activity. New patterns of family life professionally activate new groups of population. But the most important issue is situation where lack of investment capital is a norm, and not exceptional decision environment. This is accompanied with new development where cheap labor is no more source of the market competitive advantage. This in turn forces management in enterprises to seek new possibilities of growth. Qualifications form new source of the market competitive advantage. In other words, the quality of staff is equally important as the quality of technology.

Additional, important issue is accelerating progress in socio economic and technological areas which yields needs for higher specialization in qualification of employees. All this manifest itself in increased demand for staff possessing highly specialized qualifications, professionals described with adjective: welder specialized in …, office professional specialized in …, maybe more important are new areas of qualifications: bio, techno, info, etc.

The traditional situation where acquired profession was enough for whole life, often accompanied with situation: one employer for life does not apply any more. Instead, there is need for lifelong learning (LLL), which in fact means that lifelong learning, is lifelong learning life.

As a response of the system one may see education and training extension, diversification of the offer, development of informal sector leading to growth of education and training diversity, equally so with respect to forms, methods and duration of education and training. Important element in discussed area is establishment of private sector with strong expansion of non-governmental organizations. Most interesting here is new approach to education and training management, liability for results, introducing really functioning mechanisms for qual-

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1 The study was conducted in the framework of the research project entitled Rate of return measurement methods in higher education (Metody pomiaru stopy zwrotu z inwestycji na edukację w szkołach wyższych). The project has been financed by the National Science Centre on the basis of decision no. DEC-2011/01/B/HS4/02328.
ity assurance. This is mainly due to increasing organizational autonomy in connection with education and training provider’s liability for results manifesting themselves in institutional (internal) external systems of quality assurance (accreditation programs; qualification certification mechanisms).

Subject of interest in this work is education and training funded by enterprise. Although it would be easy to extend considered issues on labor market institutions, households, or institutions using EU funds. Education and training financed by enterprise rise new challenges for measurements and evaluation of results.

Traditional approach is input oriented, or cost based pricing. It concentrates on financing resources. There is need for new approach which is output oriented with focus on results. The education and training buyer is ready to finance results. This approach needs precise definition of training product (effect, result) with methods to measure and evaluate of results. In other words, instead of paying for learning, buyer pays for results. New approach introduces new terms: objectives; efficiency; effectiveness, but also their achievements criteria.

Focus on results main characteristics include facts, that program is linked to specific needs of the financing firm, estimated efficiency of where there are specific targets for the acquiring of new skills and their anticipated impact on the functioning of the organization; expectations of communicating results to participants; prepared mechanism to support the transfer of knowledge to other members of staff. All this may be summed up in designing cost-benefit analysis. In Europe (and OECD countries) there are no clean financing options. Frequently used mechanisms of financing are among others: formula (formula based funding); result (performance based funding); competition, contract, negotiation (competitive and targeted funding); past cost-based funding.

New actor in the education and training system is European and National Qualifications Framework with expectation that training product include definition of acquired knowledge; skills and other personal skills (staff social attitudes, so called soft qualifications).

2. THE FINANCING ENTERPRISE

If we assume that training is systematic shaping of staff members’ attitudes, knowledge, skills and behaviors necessary for the operations to properly perform a task or work (European definition), or that training is any procedure, initiated by the organization, aiming to enhance the learning of its members, and therefore increasing their contribution to organizational effectiveness (US definition), the assessment of the training becomes the question of improving the efficiency of the company; in the sense employee development makes it easier to
achieve the organization's objectives. Evaluation on the side of the organization is the question of efficiency. Evaluation from the participant (people) point of view is the issue of effectiveness. One has to remember, that effective personal development must consider individual potential, individual learning styles; and whole person development (life skills).

Once agreed, training is a process of raising the skill level of the participant (employee), the costs and benefits of the organization include improvement of the business efficiency - achieving the same results at a lower cost or achieving better results at the same price (cost) or improvement of productivity - achieving better results at a lower cost. If we go into details, the list of benefits for the organization (company - institution) include increase of the individual effectiveness of staff members, increase of the teams’ effectiveness and company efficiency improvement. It manifests itself in related aims: with product or service quality, individual and team outcomes and productivity. Creativity growth results in market share rise, increasing the versatility of employees and enhancing entering new markets. Next group of benefits cover improvement of customer satisfaction through: improved image of the organization or department, reducing the number of complaints and returns and increase in number of on-time delivery. Important results are connected with improvement of the internal processes by increase consistency staff groups, improvement of the quality of supervision, providing assistance in solving problems related to the competence of individual units of organization, increase in the ability of managers to determine realistic and specific goals for employees of their departments. All this leads to overall improvement in organizations efficiency.

Organization financing training, increasingly pay attention to the fact, how expenditure on training translates into functioning businesses². The reason is that in the private sector, global competition and investors are increasingly demanding greater accountability for results and expenses incurred. Accordingly, the public sector manifests the emphasis on how (judiciously) the public funds are managed to demonstrate cost-efficient use of money spent on training.

Reliable measurement of training results is possible. Credible measurement (at a reasonable cost) that show the impact of training on the company can be reliably performed. It requires prior decision on how the data will be collected and analysed, hot to define (identify) the results of training, how to perform cost estimation, the way how the data will be translated

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² In North America, a wave of discussion on the effectiveness of measuring the effectiveness of training was settled in the mid 90s. There, the problem was urgent because the share of financing the training of public funds is negligible, and commercial financing always raises the question of economic efficiency in the first place. A summary of the discussion can be found eg. in studies by Arthur W. et al. [2003] and Broad Newstrom M. [1992].
into financial indicators, determine the value nonmonetary benefits and how to measure the return on investment in training.

The scope of this work does not include traditional tools. One of popular approach is with evaluation of training effectiveness by the means of perceived and demonstrated learning outcome. Perceived learning, what the students think they’ve learned, and how the course has met their expectations. It may be measured with post course, in class or online questionnaire/survey. Additional tools include phone interviews with sample of students, student testimonials, debriefing sessions with trainer after the exam, student evaluations of trainer, peer grading where students assess each other’s’ performance. Demonstrated learning, what the students can show they’ve learned, through test results or performance in the field, etc. The measurement tools include comparison of pre and post course questionnaire and quizzes (should be the same questions on each, for comparison), external evaluation methods, take home exams or projects (to give time to synthesize material), follow up surveys to test knowledge retention and attitude (such as cultural sensitivity) change over time, witness or shadow audits to measure performance of auditor in the field and the long term impact of the training on operational knowledge, skills and behavior.

Classical approach by Donald Kirkpatrick, was first published in 1959 then updated in 1975, and again in 1994, when he published his best-known work (Kirkpatrick [1994]). The model consists of four levels of measurement, reaction, learning, behavior, results. For details one may look at official site (www.kirkpatrickpartners.com).

For further classical tools, one may refer to (Rae [2013]). This training evaluation guide is augmented by set of free learning evaluation and follow-up tools (trainingevaluationtools.pdf), created by Leslie Rae. The list of tool kits in measuring skills improvement and training effectiveness includes: 3-Test tool; Bloom's Taxonomy of learning domains\textsuperscript{3}; Psychosocial (Life Stages) Theory\textsuperscript{4}; Multiple Intelligence theory\textsuperscript{5}; Learning Styles theory\textsuperscript{6}; VAK learning styles model\textsuperscript{7}; Conscious Competence learning stages theory\textsuperscript{8}; and several other techniques. Apart from that, important issue in the training financing enterprise is the eventually achieved Return on Investment (ROI) for the organization\textsuperscript{9}. The list of reasons that evaluation processes is rarely performed consist of lack of appropriate skills; insuffi-

\textsuperscript{3} www.bloomstaxonomyoflearningdomains.htm.  
\textsuperscript{4} www.erik_ekirks_psychosocial_theory.htm.  
\textsuperscript{5} www.howardgardnermultipleintelligences.htm.  
\textsuperscript{6} www.kolbllearningstyles.htm.  
\textsuperscript{7} www.vaklearningstylesest.htm.  
\textsuperscript{8} www.consciouscompetencelearningmodel.htm  
\textsuperscript{9} Dziechciarz [2012a].
cient time in disposal, lack of sufficient resources (staff and money). On have to stress that
good methodical evaluation is excellent source of good, reliable data. On the other hand,
where evaluation is seldom performed, knowledge about the effectiveness of the training is
negligible. Good start of the literature query is book by L. Rae (Rae [2002]). Modern
techniques\(^\text{10}\) of measurement of education and training results include, among others: targeted
assessment; responsive evaluation, systematic evaluation; quasi judicial (legal) evaluation;
pre-programme evaluation (input evaluation), etc.

3. TECHNIQUES OF MEASUREMENT OF TRAINING EFFECTIVENESS AND
   EFFICIENCY

Regardless which technique is used, there are common questions used for education and
training rating: what are the advantages of different training techniques? Is it possible to con-
duct training within the organization, or whether one need to use the services of an external
company? Does the age and origin of the participants constitute an issue in taking advantage
of this and no other training techniques? How much time will you spend on training? What
were the results obtained in the past?

Evaluation criteria prior to the program consist of five issues: Socialization, do employees
know what behavior is expected of them? Commitment, whether people accept the change by
themselves or they are forced to? Allocation of prize, whether prizes (benefits) are awarded to
people progressing in the desired way? Diffusion, whether new patterns of participants behav-
ior are transferred to other employees of the company? Feedback, whether results are trans-
parent and can be used to take corrective action in the enterprise?

Data needed to evaluate education and training effectiveness include hard and soft infor-
mation (metric and nonmetric). Hard information includes performance (quantity, number,
rotation, etc.); costs (unit, according to accounts, investments, etc.); time (downtime, over-
time, breaks, etc.); quality (waste, scrap, accidents, etc.). Soft information includes: habits
(absenteeism, interruptions, delays, safety, etc.); attitudes (desirable reactions of duty, loyalty,
self-acceptance, etc.); skills (decision-making, conflict, advising, listening, etc.); development
(promotion, raise, efficiency, etc.); atmosphere (complaints, satisfaction, legal complains,
etc.); initiative (ideas, projects, etc.).

Distinguish the impact of education and training results from the routine functioning is
not easy task. One may use the pilot group versus the control group techniques, or forecasted

\(^{10}\) The text of two following chapters rely heavily on Bramley P. [2011]; Phillips J. Stone R. [2011] and Phil-
lips J. [2010].
versus the values obtained after the training. Supervisors estimate the impact of the training program on productivity, one may use external test (independent experts) that provide knowledge about the effects of the training program. Other positive changes attributed to training may come from the customer who provide with information about the extent of their decision to buy the product or service based on knowledge or skills of the staff. Financial effects estimation covers conversion of the input into additional profits or savings, calculated measures of quality costs (scrap, waste), staff time saved is converted to salary and bonuses, the data on the costs of negative growth measures (e.g. complaints), internal or external experts, supervisors, managers, or staff members estimate the value of training effects. External databases may contain the approximate value. Any calculated measure is combined with other measures, for which it is easier to estimate the costs (variable substitution, proxy). Measurement of return on investment in education and training is the final step.

Measurement algorithm of return on investment in education and training requires collection of appropriate data (before, during and after the training), isolation effects of the program from the influence of other factors, transforming data on hard and soft benefits to monetary values, estimation of total cost of staff participation in training program. Eventually, there may be performed attempt to calculate the value of return on investment in education and training (ROI - rate of return from investment).

Not all benefits are convertible into monetary units. Therefore, non-financial benefits (immeasurable, intangible) should be identified and contribute to communicating results report. One should mention a special value added here, it is the improvement of the ability to accurate forecasting the return on investment in future projects for education and training.

As stated before, the modern techniques for measuring the effect of training include evaluation based on goals; directed evaluation, system assessment, judicial evaluation, prior to program evaluation. Technique was developed in 1968 for the British Army. Requires very detailed preparation list of targets. Especially useful for the assessment of training relating to the repetitive operations (craft like).

Algorithm of evaluation based on goals starts with careful formulation of the list of targets, identification of connections of targets with the desired behavioral changes, description of the purposes of expected behavior to be formed by training participants, design of tool for measuring progress in achieving each of the objectives. The measurement tools should guarantee objectivity, integrity, and validity. The technique is designed as self-improving process. Measurement using the tools to check the level of knowledge, skills and attitudes before and after the various stages, analysis of results for quality assessment programme, development of
proposals for programme and design defects corrective steps serves as the information source for modification program.

Targeted assessment is oriented on rating (responsive evaluation). Focus on the program's objectives achieved results related to the needs of staff member involved in the training. For the task, the stakeholders are usually divided into three groups: agents who create, implement or utilize the program to be assessed, beneficiaries who benefit from the program, victims sentient its negative impact. Stakeholders in the case of training include: the organizers, the operator and the employees remaining within the impact of training (participants, their superiors and senior managers).

Targeted assessment covers the interests of all groups, taking into account: positive comments about the training program, doubts related to the program and disputes relating to the program. when evaluating targeted attempts to identify the main interest groups

During targeted assessment, the person performing assessment must know attitudes toward the program and the expectations for the results of the assessment. To meet this purpose, respondents are asked the question: do you know someone who has views radically different from you? It helps to extract opinions crucial for further study, to include into the sample people (staff) with different opinions. Sometimes it is necessary to use formal methods of sample selection (e.g. assembly of representatives of the production department, finance, marketing and HR). The evaluators do their own observations of training to be directly familiar with training content. The evaluator gradually learns the objectives of the program (both formal and real) including any doubts that may come to mind to different interest groups. Based on identified and formulated issues, the focus of evaluation is constructed.

System evaluation (systematic evaluation) consists of analysis of the entire system, including the relationships between its constituent subsystems. The purpose of this analysis is to improve relations between the subsystems and increasing the efficiency of the entire system. In order to achieve such ambitious objective, the evaluator, in accordance with the provisions of this method should look for answers, among others, to the following questions:

— Is a given training program used by those for whom it was designed?
— Is this program effective?
— What are the costs of the program?
— Are expenses incurred to carry out the program effectively used?

System evaluation may be used use to do the analysis of the various aspects of organizational effectiveness. Evaluator examines the extent to which training has contributed to greater labor productivity, assuming the performance criteria, which are considered to be key in certain subsystems of the organization. When evaluating the effectiveness of training, it is
worth paying attention to the relationships that exist between the expected benefits of participation in comparison with its estimated cost. It is worthwhile to ask additional questions: are there needs that should be met by the training and whose satisfaction must be measured by analyzing various aspects of efficiency? Is the learning process designed in such a way to ensure the participant will be able to use the knowledge acquired during the training in the workplace?

Judicial assessment (quasi-legal approach) is the method developed by L. Porter and L. McKibbin in 1988 to evaluate the effectiveness of MBA programs (Porter McKibbin [1988]). They collected information from thousands of interested parties and forwarded them to a small group of professors that teach in business schools who were asked to interpret the resulting data. The results of the analysis were favorable for business schools: the growing number of students applying for an MBA is synonymous with the success of these schools. Graduates also consider their qualifications acquired in business schools as a valuable. The method name "judicial" comes from the approach to assess the effectiveness of training and is associated with the use of techniques similar to those used in court. There are actors with the "witnesses" role, who are called for "questioning". Their opinions consist of "confessions". The algorithm puts special emphasis on checking these "confessions" (opinion, values and beliefs) formulated by program organizers; those responsible for funding and participants. The method is used most often to evaluate the effectiveness of social programs, less likely to evaluate trainings conducted in organizations. The problem in this technique is the need to select an impartial "judge" and to achieve consensus on the selection of key "witnesses".

Program assessment prior the training requires, that in order to assess the pre-program, evaluation is needed to answer the question whether certain training procedures can actually produce the desired changes. This type of training evaluation can also be called assessment of the contribution (input evaluation). Evaluation that occurs prior program covers the techniques checking whether teaching content and provision techniques are properly selected and constructed. It includes elements of informal evaluation that take place before training. Such an approach is useful in deciding how to organize training and how to allocate best the available resources. The condition for the usefulness of this method is the knowledge on the level of the expected target population (training participants). Additionally program objectives and learning habits of participants undergo evaluation that occurs prior program. The assessment consider the questions:

— What are the advantages of different training techniques?
— Is it possible to conduct training within the organization, or whether you will need to use the services of an external company?
— Does the age and origin of the participants suggest that they should take advantage of this and not another training technique?
— How much time can be devoted to training?
— What results were obtained using a particular technique last time?

The typical criteria list for evaluation prior to the program include five issues:

— Socialization (do your employees know what behavior is expected of them?)
— Involvement (whether or not people accept the change of their own accord, whether they are forced or coerced?)
— The allocation of the prize (are prizes awarded to people manifesting biggest progress in the desired manner?)
— Diffusion (whether new patterns of behavior of participants are transferred to other employees of the company?)
— Feedback (whether it is available and whether it can be used to take corrective action?)

4. MEASUREMENT FOR TRAINING EFFECTIVENESS AND EFFICIENCY EVALUATION

The data needed to evaluate the effectiveness include hard information (metric, measurable) such as the capacity (number, quantity, rotation, etc.); costs (individual, according to accounts, investments, etc.); time (downtime, overtime, breaks, etc.); quality (waste, defects, accidents), etc. The list of soft information (non metric, unmeasurable) covers habits (absenteeism, interruption, delay, safety, etc.); attitudes (desired reactions, dutifulness, loyalty, self-acceptance, etc.); skills (conflicts resolving skills, advising, listening, etc.); development (promotions, hikes, efficiency, etc.); atmosphere (complaints, satisfaction, litigation, etc.); initiative (ideas, projects, etc.). The used techniques to distinguish the impact training include approach, where there are comparisons of the pilot group versus the control group, forecasts versus values obtained after training; participants (stakeholders) estimate the volume change resulting from training; superiors estimate the impact of the training program on productivity; external research (independent experts) provide knowledge about the effects of the training program. One may include other, unexplained positive change and attribute them to training. The customer may provide information about the extent to which their decision to purchase a product or service received depends on staff knowledge or skills.

A special issue is the estimation of the financial effects. The input data are converted into additional profits or savings, costs are calculated based on (hard) measures of quality (defects, waste); saved time of employees is converted into salary and bonuses. The cost data of negative growth measures (eg. complaints) may be valued by internal or external experts, supervisors, managers, or staff training participants estimate the value of effects.
The external databases may contain an approximate value. All measures are combined with other information, for which one can estimate the costs (variable surrogate, proxy).

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Effectiveness measurement for investment to education and training in enterprise

Abstract: There is an increase in the level of awareness and acceptance of the need to enhance volume and intensity of investment in education and training in the enterprises. This phenomenon stems from the facts that societies in Europe are intensively aging; there is intense technological and organizational progress; one may notice the process of extension of the scope and length of the professional and personal development and activity; accompanied with of employees’ expectations for better quality of life.

The increase in the level of acceptance of the need to increase investment in education and training of employees is accompanied by new challenges, involving, in the first place, the need to redefine the approach to training financing and evaluation its results. High-Efficiency point of view, the assessment of the advisability of investment in education and training in the enterprise raises the need to move away from the traditional system of input oriented financing (i.e. financing resources) and move towards output oriented funding (i.e. financing results). In other words, instead of the existing paying for teaching, companies want to pay for teaching results. This means those enterprises that are financing education and training, in process of assessing training results, rise fundamental question about improving the efficiency of the company; how an increase in the qualifications of workers facilitates the achievement of organizational objectives. On the other hand, the training results assessment from the participant’s point of view includes a question about the efficiency of the supplier of educational and training programs, whether the supplier of educational and training programs is able to achieve promised results.

The existing business reality is that the efficiency and effectiveness assessment often does not go beyond the survey to measure the level of satisfaction and self-esteem of the participants. This, in turn, causes that can be observed quantitative pressures, accompanied by insufficient care for quality, accompanied with inability to use of modern techniques for measuring the impact of education and training on business performance.

As a result, many entrepreneurs treat the investment in training and education of their employees solely as an expense and disruption of operations. This is due to the fact that managers do not see a direct effect of investments in the future performance of the company. In addition, managers fear possible hazards in the form of wage claim; escaping of trained personnel to competitors companies, or excessive self-empowerment of the employee.

The study is devoted to presentation and discussion of modern techniques of measuring the effectiveness of investment in education and training. List of methods includes an analysis based on the objectives, the targeted evaluation, systemic evaluation, and assessment prior to the program.

Key words: training efficiency measurement, training financed by enterprise

Mierzenie efektywności nakładów na edukację i szkolenia w przedsiębiorstwie

Streszczenie: W przedsiębiorstwach obserwuje się wzrost poziomu świadomości i akceptacji konieczności zwiększenia wolumenu i intensywności nakładów na edukację i szkolenia pracowników. Wspomniane zjawisko wynika z faktu, że w starzących się społeczeństwach Europy, przy intensywnym postępie technologicznym i organizacyjnym pojawia się fenomen rozszerzenia zakresu i długości aktywności zawodowej oraz rozbudowę oczekiwania pracowników odnośnie jakości życia. Wzrostowi poziomu akceptacji konieczności zwiększenia nakładów na edukację i szkolenia pracowników towarzyszą nowe wyzwania, polegające głównie na konieczności przedefiniowania podejścia do finansowania i oceny wyników. Efektywnościowy punkt widzenia, przy ocenie celowości nakładów na edukację i szkolenia w przedsiębiorstwie rodzi konieczność odejścia od tradycyjnego systemu finansowania zasobów i przejście do proefektywnościowo zorientowanego finansowania efektów. Innymi słowy, zamiast dotychczasowego płacenia za uczenie, firmy chcą płacić za nauczenie. Oznacza to, że finansujący edukację i szkolenia oceniając skzolenie zadaje pytanie o poprawę efektywności firmy; o to, na ile wzrost kwalifikacji pracowników ułatwia osiąganie celów organizacji. Z drugiej strony, ocena od strony uczestników zawiera pytanie o skuteczność działań oferenta przedsięwzięć edukacyjnych i szkoleniowych. Dotychczasowa praktyka polegała na tym, że często ocena efektywności i skuteczności treningu nie wychodziła poza ankietowy pomiar poziomu satysfakcji i samooceny uczestników. To powoduje, że obserwuje się presję ilościową, której towarzyszy niedostateczna troska jakościowa oraz nieumiejętność stosowania nowoczesnych technik pomiaru efektu kształcenia. W efekcie, wielu przedsiębiorców traktuje szkolenia i edukację swoich pracowników, jako koszt i zakłócenie funkcjonowania. Jest to spowodowane tym, że nie widać bezpośredniego efektu inwestycji w przyszły rozwój firmy. Dodatkowo, obserwuje się obawę menedżerów przed zagrożeniami w postaci rozszeć placowym, ucieczki wyszkolonych pracowników do firm konkurentów, lub nadmiernego usamodzielnienia pracownika. W opracowaniu zaprezentowano i przedszkutowano nowoczesne techniki pomiaru efektywności nakładów na edukację i szkolenia. Lista metod obejmuje analizę opartą o cele, ocenę ukierunkowaną, ocenę systemową, ocenę sądową, oraz ocenę poprzedzającą program.

Słowa kluczowe: pomiar efektywności szkolenia, szkolenie finansowane przez przedsiębiorstwo
#661 Summary

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