

RETURN ON TRAINING IN KNOWLEDGE-BASED ECONOMY: REVIEW AND ANALYSIS OF EXISTING APPROACHES TO EVALUATION OF TRAINING OUTCOMES

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ABSTRACT

Various studies report that in knowledge-based economy the company's sustainable growth and prosperity depend on its highly educated and skilled employees. Having identified a positive correlation between investments into personnel training and development, and the bottom-line results, organizations pump millions of dollars into human resources and, therefore, want to estimate payback of such huge investments. In order to justify training costs, especially during a downturn, training professionals should be aware of current training evaluation techniques and master the language of numbers for successful communication with financial department and top management. Basing on the review of dozens of books, articles and reports dedicated to the training evaluation, this paper analyses the existing approaches to estimating return on investments into training and development programs. This study highlights the traits of up-to-date methods for estimating return on training, identifies their weaknesses and outlines the areas for further research of this challenging subject.

Keywords: Return on training, ROI of training, training evaluation, knowledge management, human resources

INTRODUCTION

In general, a topic of return on investments (ROI) into human capital, and, in particular, payback from corporate education aiming at employees' training and development attracts a growing attention of top management. It can be explained by two main reasons: firstly, highly skilled and educated staff is a key successful factor for knowledge-based economies and, secondly, considerably increasing expenditures on personnel training programs.

The purpose of this paper is to study a current status in the area of training evaluation and calculating ROI of training and development programs in order to identify a gap between existing theories, methodologies, models, approaches and new models and tools required by

training professionals and business practitioners that would allow them to calculate adequate and realistic ROI estimates before any human, financial and time resources for a particular training program have been allocated.

The paper reviews 50 various books, articles and reports on the training evaluation, analyzes the existing approaches to estimating ROI into training and development. In conclusion, it highlights the traits of up-to-date methods for estimating return on training, identifies their weaknesses and outlines the areas for further research of this challenging subject.

LITERATURE REVIEW AND ANALYSIS

The reviewed sources are quite diverse and range from general and descriptive articles stressing the importance of training evaluation process to the reports on the real projects initiated by companies for estimating ROI of training and development activities. All reviewed literature has been grouped into five sections:

- Importance of training evaluation
- Cost-Benefit Analysis
- Measuring tangible training costs and business outcomes
- Methods and models for quantifying educational expenditures and benefits
- ROI Case Studies

Importance of training evaluation

Gary (2003) reports that in knowledge-based economy the key element of wealth generation is company's people, and more than half of the corporate expenditures are personnel-related. Therefore, it becomes natural that more and more companies are eager to evaluate and to measure ROI into employees. The author underlines the positive correlation between investments into staff and company's bottom-line results. However, at the moment majority of organizations are not able to solve this challenging task due to the complexity of measuring such intangible effects and a lack of proper metrics and approaches. Nevertheless, Gary (2003) concludes that measuring the ROI of human capital is an emerging science, and company must develop their own metrics and solutions in calculating ROI in employees.

‘Although it is increasingly recognized that human resources are crucial for the competitiveness and economic success of firms, research has paid scant attention to economic aspects of such resources. Major parts of the human resource management literature, and in

particular the human resource development literature, have been dominated partly by psychological approaches and partly by prescriptive, practical approaches. These are of course important for the development of the field but only to a limited degree do they allow for investigation of economic aspects of human resources on the firm level' (Nordhaug 1993, 21).

Caffarella (1988, 223) highlights the importance of the evaluation and states that very often 'program evaluation data are collected and then left on someone's shelf or in a computer file'.

Casey (1991) reports that training evaluation is very complex task educators are facing. There are various evaluation techniques that range from such notions as 'good' and 'bad' to more systematic measurement approaches such as questionnaire.

Plenty of books and articles explain in details the training evaluation process that however, refers to 'the extent to which the teaching conforms to the curriculum' (Gasskov 2006, 233). Various assessment techniques basing on data-gathering methods (questionnaires, interviews, case studies) aim at obtaining satisfactory surveys only (Gasskov, 2006).

Jamrog and Overholt (2005) underline the need for HR professionals to change their current role within a company by moving from purely administrative and routine tasks to the acting as a strategic business partner. This transition would require measuring the ROI into HR activities including training costs on the company's business. Referring to the work of Cabrera and Cabrera, researchers conclude that 'as marketing needs to know the impact that the campaign has had on sales and brand recognition, HR needs to know the impact that the HR activities are having on the business' (Jamrog and Overholt 2005, 5).

Bray (2007) has made a literature review of 28 various books and articles about Knowledge Management (KM). Findings prove that 'both KM infrastructure capabilities and knowledge processes positively influence organizational effectiveness' (Bray 2007, 2). Studies also consider the KM impact on the organizational performance that includes 'KM satisfaction, return on assets, return on sales, and organizational effectiveness' (Bray 2007, 3).

There have been developed plenty of analytical tools for identifying the potential benefits and financial outcomes from investing into human capital. HR practitioners are strongly motivated

to obtain the analytical models for estimating a link between investments into staff and the ultimate shareholder/business value, e.g. sales revenue, net profit or Economic Value Added (EVA). Iyer (2010) mentions the urgent necessity for developing tools estimating ROI into employees, and lists the software available on the market that try to solve such issues (Oracle Work Force Analytics, Cognos from IBM, Accenture's Human Capital Development).

Jacobson and Prusak (2006) report that companies continue to invest billions of dollars into information-search system, because they consider 'knowledge management' only as 'knowledge search'. However, the research findings show that further IT investments will not bring significant results. It is recommended to focus more on how and why certain employees are eager to gather and apply tacit knowledge that can be codified and transferred to others.

Langer and Mehra (2010) have examined the impact of training within one of the largest Indian IT companies. They gathered and analyzed data on delivered training, performance, and demographic aspects, and concluded that 'training has a positive impact on performance. An additional training course, for example, can help employees improve performance by 3.6 per cent ceteris paribus' (Langer and Mehra 2010, 16). Authors studied two kinds of training (general and specific) and come up with the key implications for senior management: 'training investments lead to improved employee productivity' and the focused training results in 'the highest returns from their investments' (Langer and Mehra 2010, 18).

Gardner, McGranahan and Wolf (2011) argue that organizations can improve their financial results if they analyze interplay between HR practices and productivity. Measuring the business outcomes of HR approaches is still nontrivial and calculating ROI on training is among hottest HR-related topics. However, 'questions such as "What is the ROI of training?" and "Which screening techniques yield the best performing recruits?" or "What target-setting approach will best motivate performance?" have been met with imprecise answers' (Gardner *et al.* 2011, 1). Authors state that 'the widespread adoption of Enterprise Resource Planning (ERP) and HR information systems has made data on business operations, performance, and personnel more accessible and standardized' (Gardner *et al.* 2011, 2). Though, it is not clear how and what particular techniques and IT systems can facilitate 'a new kind of dialogue about the link between people and performance' (Gardner *et al.* 2011, 5). It is also worth to note that availability of financial data, personnel records, etc., e.g. through ERP system is a *sine qua non* for calculating ROI of training. However, many researchers report that even

internal HR departments experience high barriers to access the needed sensitive data, let alone outsourced HR services or external consultancy firms and researchers.

DeFond, Konchitchki, McMullin and O’Leary (2011) examined a link between a superior company’s Knowledge Management (KM) and its shareholder value, and quantifying the stock market’s consequences (shareholder value) for the companies receiving the “Most Admired Knowledge Enterprise” (MAKE) award. Having used short window event study methodology and analyzed rich statistics relating to a final sample of 247 MAKE awards issued to 46 distinct companies from 2001 through 2008 years, DeFond *et al.* (2011) have found that successful implementation and utilization of KM leads to the growth in the shareholder ‘due to expected superior operating performance’ (DeFond *et al.* 2011, 6). These findings are consistent with a plethora of other researches studies proving that knowledge is a critical element in value creation, and that successful KM results in better organizational performance. On the other hand, DeFond *et al.* (2011, 37) underline that it is not correct to draw a conclusion that ‘implementing KM systems, *per se*, necessarily leads to increased shareholder value’, because only MAKE winners had been studied.

Cost-Benefit Analysis

Cost-benefit analysis is one of the financial oriented approaches for estimating a decision to be made in terms of expected benefits from a new project of business venture (Biggs 2010). A lack of studies about ROI can be explained by scarce resources available within companies. Therefore not all companies are able to conduct such investigation, since ‘most business research is only conducted in larger organizations’ (Biggs 2010, 51).

The International Encyclopedia of Educational Evaluation (Walberg and Haertel 1990) gives in-depth and comprehensive picture about evaluation theories and practices with regard to education. The term *evaluation* is defined as a ‘careful, rigorous, examination of an educational curriculum, program, institution, organizational variable, or policy’ (Walberg and Haertel 1990, xvii). Though this definition does not imply the calculation of the ROI into education, Walberg and Haertel (1990, xviii) make a reference to the cost-benefit or cost-effectiveness approaches that ‘seek to quantify the resources consumed by a programs, and to relate these resource expenditures to the monetary benefits or program effects obtained.’ However, Walberg and Haertel (1990, 63) confess that ‘costs have not received adequate attention in evaluation work. The reason for this is not clear.’

Basing on the cost-benefit analysis and having surveyed the data about the type (in-firm, external training, etc.), time, date and place of training, López-Acevedo (2005) concluded that ‘Using cross-cohort comparison, these evaluations also suggested that CONALEP graduates’ earnings increased rapidly within the first two to three years of employment’ (López-Acevedo 2005, 13). The researcher explains that ‘The ideal evaluation requires the use of experimental methods, which implies that the above groups (treatment and non-treatment) would have been constructed by randomly assigning each unit to either group. With large samples randomization ensures that the two groups are mostly identical with the exception of the treatment. However, in evaluations of social science random selection is difficult.’ He further develops: ‘...non-experimental methods can be utilized: propensity score matching, reflexive comparisons, double difference, and instrumental variables’ (López-Acevedo 2005, 15).

Measuring tangible training costs and business outcomes

Buyens and Thang (2009) reviewed more than 70 works published from 1991 to 2007 and found the positive correlation between training and both organizational financial metrics (ROI, sales, productivity, profit, market share, etc.) and non-financial performance (turnover, absenteeism, job satisfaction, motivation, etc). The reviewers analyzed 66 studies: 52 inquiries use ‘firm-level data of large sample of firms’ (bivariate data analysis using Pearson’s coefficient) and the rest 14 case studies basing on ‘detailed data from one specific company’ (Buyens and Thang 2009, 4). Buyens and Thang (2009) identify limitations and weaknesses of these studies that could be considered as the opportunities for the future research. Firstly, analysis of the heterogeneous companies from different industries results in ‘a lack of consistency in their calculation and measurements’ (Buyens and Thang 2009, 11). Secondly, case studies findings cannot be generalized to other companies. Thirdly, due to the subjective performance measures, the research findings ‘are not comparable across companies over time and the results depend a lot on assumptions’ (Buyens and Thang 2009, 12). Fourthly, there are doubts about credibility of actual ROI figures reported in all 14 case studies: the impressive three- or even four-digit ROI figures (%) could imply that presumably, ‘companies do not want weak results publicized’ (Buyens and Thang 2009, 15). Fifthly, getting clearer picture of training results is not possible without further research in various industries. Sixthly, the majority of studies have been done in developed countries, thus the developing countries are not represented. Seventhly, more rigorous analysis must take into account the employee’s

type (worker, supervisor, office staff, manager, etc.), job characteristics and locations. Eighthly, 'low response rate of questionnaire or lack of reliable data for estimation' represent 'methodological limitations of these studies' that 'open some other opportunities for future research' (Buyens and Thang 2009, 18).

Gopal (2010) have highlighted that the company's HR system has become a subject to growing pressure caused by the increased demand of business to obtain the ability to measure tangible outcomes from HR function. Despite the availability of various metrics 'to measure the return on investment of human capital', HR systems still lack of 'relatively straightforward set of metrics that indicate the effectiveness of HR systems, and the efficiency with which they work' (Gopal 2010, 21). The author also report that one US manufacturing company discovered that proper employees' skill development resulted in substantial reduction in accidents in its plants.

Bryan (2007) reports that companies continue to use a performance metric such as return on invested capital (ROIC) which is becoming obsolete and do not reflect the real contributors into company's tangible success. They must change performance metrics because of shifting from capital-intensive economy to knowledge-based society. Bryan (2007, 57) states that companies do not take into account 'the real engines of wealth creation today: the knowledge, relationships, reputations, and other intangibles created by talented people and represented by investments in such activities as R&D, marketing, and training'. Thus properly selected and trained employees transform knowledge into cash. However 'each intangible specific contribution is hard to assess' (Bryan 2007, 58). Bryan offers a metric called 'Profit per employee' that it is a 'good proxy for earnings on intangibles, partly because the number of people a company employ is easy to obtain' (Bryan 2007, 60). In addition to easiness in obtaining the number of company's employees (that is not always true), Bryan mentioned another advantage of this metric – benchmarking can be done readily because calculations are 'based on accounting conventions' and 'requires no adjustment' (Bryan 2007, 61).

Matson and Prusak (2010) have identified and analyzed the barriers impeding the productivity of knowledge workers. They also mentioned that unlike the production employees or clerks, knowledge workers perform various tasks that are quite often not easy to be formalized.

Tobin (2004) provides an example of calculating ROI for Knowledge Management (KM) solution for call centers and help desk systems. The calculations are based on average values of the typical performance metrics obtained from the customers who bought and implemented ServiceWare KM applications for customer service and IT support. These metrics are increasing first call resolution, average talk time, average growth in clients' contacts.

Shirobokov and Roe studied the American Educational Structure, labor markets and perceptions of marketability. Survey-based findings prove that job-related learning improves individual choices, earnings, and company's performance (Shirobokov and Roe, 2005).

Manski and Garfinkel (1992) dedicated their research to the evaluation of the welfare and training programs. Having analyzed various methodological issues connected to evaluation approaches, authors, however, study the impact of training programs on individuals, namely, his or her earnings. Thus, the ROI in corporate training is not covered.

Boudreau (2002) measures knowledge at more aggregate levels, i.e. the unit of analysis is a company, not an individual. Basing on the ample literature review, the author asserts that human capital has the strategic value for an organization and shapes the organizational competitive advantages. Boudreau (2002) states that gauging knowledge on a regular basis leads to better human capital utilization. Author demonstrates the evolution of knowledge measures from pure qualitative to the quantitative that relate to the new accounting system for intangibles that treats training expenses and R&D activities as the assets that may accrue over time. Such 'knowledge-based earnings' (a term coined by Baruch Lev) could be patents, publications, and citations (Boudreau 2002).

Joyce and Woods (2001) report six groups of key performance indicators: environmental, market and customer, competitor, internal business processes, human resource (employee morale, employee competence measures, turnover ratios) and financial indicators (revenue growth, return on sales, return on capital, return on equity, cash flows).

Methods and models for quantifying educational expenditures and benefits

Darrrough and Ye (2006) have analyzed the issues of the valuation of loss firms in a knowledge-based economy that is witnessing a growing number of loss companies. Using modified benchmark model developed by Ohlson, the researchers concluded that the

conservative accounting still treats R&D investments as expenses that account for the negative relation between the company's market value of equity and its earnings. According to the existing accounting principles, considerable investments into knowledge generation and management, e.g. in R&D, could turn a profitable company into a loss firm. However such firms 'are able to survive and receive high market valuation because of their future prospects despite current losses' (Darrrough and Ye 2006, 25).

Kirkpatrick (1976) defined evaluation as a process determining the effectiveness of a training program and offered the well-known model evaluating reaction, learning, behavior, and results. The results are tangible training benefits such as 'reduced turnover, reduced costs, improved efficiency, reduction in grievances, increase in quality and quantity of production, or improved morale' (Kirkpatrick 1976, 18-20). The ultimate goal of the whole evaluation process is to estimate the ROI in training and to make decisions regarding allocating financial resources to the current and future training needs. Kirkpatrick (1976, 18-21) shares this opinion and noted that 'From an evaluation standpoint, it would be best to evaluate training programs directly in terms of results desired.' However, there are many factors that make the evaluating results of certain training programs impossible, and it is advised to reduce the evaluation procedure to three stages only: reaction, learning, and behavior.

Training evaluation 'provides the impetus for program improvements, exhibits the worth of the program to interested observers, and allows the program planners and managers to see the fruits of their labor through tangible results' (Phillips 1987, 220). Training evaluation requires hard and soft data: the former is easy to measure and to be expressed in dollar values, the latter is more subjective. Hard data can be grouped into four categories: 'output, quality, costs, and time'; 'soft data are less credible as a performance measurement and are usually behaviorally oriented – relating to a feeling, attitude, or perception, such as complaint, grievance, or action' (Phillips 1987, 221). Referring to the Kirkpatrick's model, Phillips (1987) argues that 'the ultimate level of evaluation is the results', 'evaluation of results has the highest value to the organization' and that 'the measurement of reaction is the most frequently used evaluation method, while the measurement of results is the least frequently used method' (Phillips 1987, 225). Phillips notes that 'not enough HRD professionals are evaluating the results of their efforts. Finally, measuring reactions is easier than measuring results... It is a relatively simple process to secure reaction to a training program, but it can be extremely difficult to measure accurately the economic impact of the program on the

organization (the results).’ He also states the importance of properly designed evaluation instruments that ‘come in a variety of forms but usually include questionnaires, surveys, tests, interviews, and observations...’ (Phillips 1987, 225).

Phillips (1985) differentiates all educational activities into three groups: training, education and development. Each type has its focus, economic classification and a risk level, and the measured data ‘may be given as absolute number, ratios, percents, time spans, or dollar amounts’ (Phillips 1985, 135).

Phillips and Stone (2000) offered a systematic and practical training evaluation approach denoted as ‘The ROI model and process’ consisting of 10 components including calculating the Return on Investment (ROI) that represents the Level 5 of the authors’ new five-level evaluation framework. However, the very method or formula for calculating a ROI has been not developed further.

Bhatnagar (1987) states that decision-makers are not satisfied with the vague and qualitative generalizations. The author mentions 47 evaluation methods including Cost-Benefit Analysis, and employs experimental design for measuring training gain (control vs. treatment groups).

Basing on statistically processed data such as expert opinions, interviews, observations and questionnaires, Virmani and Seth (1985) studied the impact of management training and development programs, and confessed the intrinsic complexity of training evaluation process.

Wolfe (2006) reports that ROI into R&D (Research and Development) are always positive and vary between 20% and 50%. The findings demonstrate the growing importance of payback evaluation from investment into knowledge development and generation in the knowledge-based economy. For instance, US National Institute of Standards and Technology (NIST) conducted a substantial research on evaluating the benefits from different research projects and introduced the economic impact measures such as the benefit–cost ratio (BCR) and social rate of return (SRR). NIST says that it is unfeasible to measure all effects of R&D.

Flamholtz (1985) argues that investments into personnel in knowledge-based economy often exceed those in equipment. Traditional accounting system treats investments in human capital as an expense, but a personal computer will be considered as an asset. The approaches of

measuring benefits from highly-skilled personnel must be changed, and the Human Resource Accounting (HRA) addresses this issue. Flamholtz (1985, 13) stressed the problem of evaluating return on the human capital investment: 'Human resource professionals face two problems in budgeting human resource development: assessing the value of a proposed investment in human resource development and then estimating the cost of the proposed expenditure'. Flamholtz (1985) also pointed out that the evaluating the value of human resources to a firm is a stochastic (probabilistic) process. He developed the stochastic rewards valuation models that take into account mutually exclusive set of states (positions) an individual may occupy in the company, the value of each state to the organization, a person's expected tenure, probabilities of moving among these states, and time value of money (discounted expected future cash flows). However, applying this model encounters a lack of historical data: the number and types of position-to-position changes during each year presented in the form of a state transition matrix, the values for all states within the company, and turnover rate statistics for each position for last several years (Flamholtz 1985).

Accenture undertook a large-scale project for calculating the ROI in learning. A rigorous analysis of data obtained through the surveys and questionnaires and statistically processed resulted in ROI of 353%. Vanthournout *et al* (2006, 50) explained 'why adequate ROI models are so rare: because they require painstaking and arduous attention to detail.' Accenture also developed a qualitative 'V-Model of Learning and Training' that is similar to the Kirkpatrick's model and the Phillips's ROI Evaluation Process (Vanthournout *et al* 2006).

Olson and Aaron (2007) attract attention to the vital importance of evaluating ROI in knowledge-based economies, especially in consultancy industry that generates revenues solely through their employees' brains that must be constantly trained. Olson and Aaron (2007, 1) state that Accenture has created 'a unique and innovative asset, the Accenture V-Model for Learning and Knowledge Management' that 'links business needs to the specific outcomes of the learning assets to be developed, and provides a framework for measuring results across all levels of delivery—from deployment of the solution through return on investment'. However, this model resembles approaches offered by Kirkpatrick and Phillips.

Shepherd (1999) argues that ROI is a paramount instrument for predicting and evaluating the monetary benefits of training programs. Shepherd (1999) gives guidelines for identifying

possible training costs and benefits, and calculating a ROI and a payback period for given data on total costs and total benefits:

$$\text{ROI (\%)} = [\text{Total Net Training Benefits} / \text{Total Training Costs}] \times 100$$

$$\text{Payback period (months)} = \text{Total Training Costs} / \text{Monthly Benefits}$$

Habershon (1996) warns training professionals against following Kirkpatrick's model strictly and blindly when measuring training impact. He argues that HR department must be in charge of obtaining data for measuring results of training and development. In order to make the whole measurement process manageable, Habershon (1996, 28) offers to set up different targets for measuring the outcomes on each level of the Kirkpatrick/Hamblin model:

‘For example, at level 1 all participant reactions should be obtained and analyzed. At levels 2, 3, and 4 the percentage should drop from 100% to 50%, and 40% to 10% respectively, and only some 5% of the overall T/D effort should be subjected to rigorous ROI calculations (including statistical modelling)’.

Habershon (1998) reports about two models for calculating ROI for training and development: Traditional Financial Model and New Model. According to the Traditional Model, the ROE (Return On Equity) is calculated as follows (Habershon 1998, Figure 5, 34):

$$\text{ROE} = \text{Margin} \times \text{Productivity} \times \text{Leverage}$$

(Margin=Profits/Sales, Productivity=Sales/Assets, Leverage=Assets/Equity)

A New Model calculates ROE as follows (Habershon 1998, Figure 4, 34):

$$\text{ROE} = \text{Investment} \times \text{Effectiveness} \times \text{Impact}$$

(ROE=Profits/Sales, Investment=Organizational Investments/Sales, Effectiveness=Capabilities/Organizational Investments, Impact=Profits/Capabilities)

Lauer (2002) reports that the human capital theory was the underlying platform for plenty of ‘empirical studies on the wage structure and on the returns to education.’ However, she highlights that ‘only a few studies deal with the basic assumption of the human capital theory: that rational individuals weigh the costs and the returns of the various educational options they face when deciding how much they want to invest in their education’ (Lauer 2002, 443). Basing on the massive arrays of data from the German Socio-Economic Panel (GSOEP, waves 1984-1997) and regional data from the Federal Office for Statistics and from the Federal Ministry of Research and Education, Lauer (2002) applied *t*-test technique and

analyzed whether costs and returns influence on a decision to attend higher education. Mostly qualitative research findings prove that if the ratio of marginal cost and marginal return expected from higher education is below a certain threshold, then an individual will choose to enroll in tertiary educational program. The empirical results have also shown that financial constraints (e.g. family's income) and incentives (grants and loan available), as well as social origin significantly affect the probability of going for higher education.

Basing on the human capital theory and cost-benefit model, Wolter and Weber (1999) have calculated the private rates of return to education in Switzerland. They used statistical data from the Swiss wage structure survey in order to calculate an Internal Rate of Return (IRR) by comparing discounted education-related costs with discounted future earnings resulted from the educational program. This empirical research performed for Switzerland indicates that 'once educational costs have been deducted, wage-earning advantages for different educational groups are insignificant' (Wolter and Weber 1999, 366).

Longenecker, Simonetti and LaHote (1998) present the study findings of 152 seasoned managers who participated in various formal executive educational programs. Having analyzed and systematized managers' responses, researchers have found the key factors influencing the effectiveness of management educational programs. They can be grouped into three categories: instructor's profile, learning process and learning environment. Longenecker *et al.* (1998, 157) found three main learning strategies that would improve the ROI on formal managerial training: 'being an action-oriented learner; accountability for application; and ongoing review of material and key concepts.'

Anthony, Perrewé and Kacmar (1999) offer a Kirkpatrick's model for training evaluation. However, authors do not explain the methodology for calculating ROI and just recommend longitudinal cost-benefit analysis with control groups that is 'a methodologically superior assessment technique of training effectiveness' that 'attempts to determine the measureable benefits from a training program over given time periods measured at periodic intervals (such as three months, six months, and one year)' (Anthony *et al.* 1999, 356). But in many cases this approach is not feasible due to time and costs constraints and a lack of sensitive data.

Mondy and Noe (2005, 224) report that 'corporate America spends billions of dollars a year on employee training', however, 'there is no consensus within the training community on how

to determine its value'. They also state that 'if you do not collect accurate data and feedback on the effectiveness of your training programs, you just may be wasting money' (Mondy and Noe 2005, 224). The authors refer to the Kirkpatrick's model and do not develop it further.

Noe, Hollenbeck, Gerhart and Wright (2004) depict measuring results of training in the form of a star representing five measures of training success: trainee satisfaction, transfer of training, new skills and knowledge, performance improvements, and return on investment (Noe *et al.* 2004, Figure 7.5, 222). Noe *et al.* present an impressive example of how IBM invested into Basic Blue e-learning program for new managers and reached ROI=46.65, i.e. every \$1 dollar has earned almost \$47. However, the ROI calculations has not been revealed.

Snell and Bohlander (2007) offer Kirkpatrick's model for training evaluation and state that 'HR managers are responsible for calculating and presenting these benefits to the company's top managers. The benefits can include higher revenues generated, increased productivity, improved quality, lower costs, more satisfied customers, higher job satisfaction, and lower employee turnover' (Snell and Bohlander, 2007, 313). Authors present a simple formula for calculating a ROI ($ROI = \text{Results} / \text{Training Costs}$) and eight metrics for benchmarking training activities: 'Percent of payroll spent on training, Training dollars spent per employee, Average training hours per employee, Percent of employees trained per year, Human resources development staff per 1'000 employees, Cost savings as a ratio of training expenses, Profits per employee per year, Training costs per student hour' (Snell and Bohlander 2007, 316).

Referring to van de Vliet, Price (2007, 534) report that 'of 200 organizations attending conferences held by the UK Work Foundation, only 10 per cent had an evaluation system in place'. However, Price (2007, 534) develops 'that at least 75 per cent of organizations were using some form of evaluation', for instance, 'happy-sheets' or questionnaires. These tools are biased due to various reasons, e.g. established personal relationships between trainees and an instructor, emotional state of participants while completing a survey and taking the world 'on a comfortable, rosy glow' (Price 2007, 535). In sum, Price (2007) concludes that training evaluation techniques are still underdeveloped and unsophisticated.

Bernardin (2003) highlights the inability to measure training outcomes at full extent and states that a new criterion, i.e. ROI, has been added recently only. Bernardin (2003) refers to two most popular approaches: calculating ROI and utility analysis. He also provides the ROI

calculation for two companies: an unknown pharmaceutical firm and Magnavox Electronics Systems Company. The former reported average ROI of 45% and 156% for managerial training programs and the sales and technical training programs respectively. The latter is proud of reporting a ROI of 741% for ‘an 18-week literacy program for entry-level electrical and mechanical assemblers’ (Bernardin 2003, 183). Utility Analysis relies ‘on subjective estimations’, and ‘has not yet gained widespread acceptance by trainers as a practical tool for evaluating return on training investments’ (Bernardin 2003, 184).

ROI Case Studies

European Foundation for Management Development (EFMD, 2002) describes the research project aiming at estimating the return on investment (ROI) of management training and development. Its report includes six case studies contributed by the companies from various industries and sectors.

The basic ROI formula is very simple and originates from financial world, where the return on invested capital is defined as a ratio of net benefit to investment costs. While a calculation process itself is quite straightforward, obtaining costs and benefits of training programs is very challenging task. Both direct and indirect training costs ‘are usually obvious and easy to capture, whereas benefits can be difficult to quantify’ (EFMD 2002, 12).

This research project identified the following challenges of measuring ROI (EFMD, 2002):

- Difficulties of linking “soft skills” training programs (e.g. leadership) to tangible performance improvements.
- Complexity of measuring personal performance of individuals operating in teams with interdependent roles and responsibilities.
- Limited access to the relevant data due to skepticism and fear that obtained data will not be analyzed and presented regularly and properly.
- Lack of assistance from finance department.
- Defining a time period for which a ROI is calculated (it depends on expected employment tenure, future promotions and turnover rate).

EFMD (2002) reports that the main model for calculating ROI was the PDI model created by Pete Ramstad from Personnel Decisions International (PDI) company. DHL applied Phillips’s

model. PDI model considers benefits from training and development as ‘a function of two distinct components: *effectiveness* and *impact*’ (EFMD 2002, 15):

$$\text{Benefit (Value Created)} = \text{Effectiveness (Increase in Capabilities)} \times \text{Impact (Value of Capabilities)}$$

PDI model implies that *effectiveness* and *impact* can be gauged independently (EFMD 2002).

EFMD (2002) asserts that measuring improvements expected from training must be done before and after it has been run. However, case studies proved that ‘most of the companies participating in the ROI project carried out measurement retrospectively’ (EFMD 2002, 19).

Case Studies

IBM Case Study

Monetary benefits from training were calculated using the following formula (EFMD, 2002):

$$\text{Benefit} = \text{Revenue} \times \text{Effectiveness Improvement} \times \text{Investment period}$$

where

- *Revenue* – sales revenue per employee in IBM Services (USD150’000-200’000);
- *Effectiveness Improvement* – the average improvement (%) in students’ scores on the 360° appraisal for six management areas defined by IBM management group using Delphic oracle technique. Calculations were based on the average improvement of 8.4%;
- *Investment period* – number of years during which a return was expected. In this case IBM decided to use three-year investment period taking into account that during the first 18 months (1.5 years) there will no be any benefits from newly acquired or improved skills. Therefore, benefit period will be 18 months (1.5 years).

For total training costs per student equal to USD10’000, IBM got two ROI values: 184% and 278% for USD150’000 (min) and USD200’000 (max) revenue respectively. IBM noted that ‘the calculation did not cover all the costs (for example, the cost of students dropping out of the course)’, ‘ROI was more applicable to training courses involving ‘hard’ rather than ‘soft’ skills’ and that ‘ROI could be used to make hasty decisions and a single attempt at ROI provided a ‘snap shot’ rather than an on-going picture of \$benefit’ (EFMD 2002, 44).

Banco Santander Central Hispano (BSCH) Case Study

Having both retail and commercial banking branches in Spain, BSCH introduced a training program aimed at developing its foreign business in terms of increasing market share,

improving sales processes, service quality and cross-selling opportunities (EFMD 2002). Measurement strategy included comparison 'participants and participating branches with 'controls' on a set of indicators before and after the training period' (EFMD 2002, 50). For measuring training benefits, BSCH has chosen the following four foreign business indicators: percentage of extra sales, time savings, foreign business's growth rate and revenue and profit resulted from this growth (EFMD 2002). BSCH's training costs included 'the time involved in developing the programme; the cost of the instructors, course materials and so on, the hardware and software, the educational facility, and the participants' salaries and the cost of replacement when training was given during company working time' (EFMD 2002, 53). Later, however, BSCH decided to simplify calculating the training benefits by measuring and comparing only foreign business revenue generated by both trained and untrained branches. The difference in revenues was supposed to be attributed to the training impact. Using all available data on training costs and benefits (gain in foreign business revenue) and assuming that $ROI = (\text{Benefit} - \text{Investment}) / \text{Investment}$, BSCH calculated ROI 'over the first year of operations following the training effort' that is 1268% (EFMD 2002, 61). The reason why the ROI is so extremely high is that 'the training costs of the participants themselves do not enter into calculations', and the training was arranged 'outside normal working hours, so no salary and other compensation elements were included' (EFMD 2002, 61).

DSM Case Study

DSM, a Dutch medium-sized chemical company, intended to gauge financial benefits of the Strategic Management Course (SMC) being run once a year (EFMD 2002). For calculating ROI two values of benefits were taken: average value of all responses that was 19'307 Dutch Florins per head (8'761 Euros) and most cited figure of 25'000 Dutch Florins (11'344 Euros). Training costs were calculating for two cases: with and without program development expenses (EFMD 2002). The Director of Corporate Management Training targeted at 20% ROI EFMD (2002). Basing on above mentioned data and given the number of participants equal to 27, DSM has got four ROI figures.

For average (conservative) monetary benefit of 19'307 Dutch Florins per head:

- ROI without development costs = 48.0%
- ROI with development costs = -5.6%

For most cited (optimistic) monetary benefit of 25'000 Dutch Florins per head:

- ROI without development costs = 91.7%

- ROI with development costs = 22.2%

Therefore, ‘only in the case of taking all the development costs on a one-off basis, and the more conservative monetary benefit figure, is the 20% ROI target not met’ (EFMD 2002, 78). It is worth to notice that EFMD (2002, 79) highlights a lack of ‘more practical examples, pointers, tips, etc.’ for measuring ROI in the current literature that is ‘mostly very theoretical’.

REPSOL Case Study

REPSOL is a large Spanish petroleum company amounting for about 30% of the gasoline stations in Spain (EFMD 2002). The key goals of training program were increasing market share by extra 30% and ‘increase the market orientation of the technicians’ (EFMD 2002, 83). REPSOL did not provide any ROI results that can be explained by the fact that ‘most of the improvements were directly a result of management “getting their act together” and putting in a measurement and tracking system to deliver the required economies’ (EFMD 2002, 92).

The Bank of Ireland Case Study

The Bank of Ireland is the biggest provider of financial services in Ireland. Having faced severe competition and shortage of new hires, the bank decided to develop in-house employees through training (EFMD 2002). Out of six training programs, “Business Banking 1” was chosen for ROI project, since it was expected to gain the most considerable benefits out of this training. The bank’s group of experts identified costs and benefits of the training program. Analysis revealed that monetary values of training average costs, improved effectiveness and increased impact of the training are 3’406 Euros, 4’977 Euros and 23’940 Euros respectively (EFMD 2002). ‘ROI calculations can be made and defended’ and ‘a precise ROI figure is not actually required or necessary helpful’ (EFMD 2002, 101).

DHL Case Study

DHL is the ‘pioneer and market leader of the global air express industry’ with a ‘fleet of over 250 aircrafts’ (EFMD 2002, 102). DHL decided to estimate benefits from the training program called Excellence in People Management. Data for defining tangible benefits (estimated value) were collected through questionnaires distributed among participants and their managers. After that the estimated value was ‘multiplied by the confidence level (%) to compute the “actual” monetary value’ (EFMD 2002, 104). It is quite interesting, that

participants and their manager reported the ROI figures that are very close to each other: 711% and 768% respectively (EFMD 2002).

Having reviewed the ROI project results, Habershon (1999) concludes that, firstly, rigorous ROI methodology resulted in more disciplined and holistic measurement approach based on the Kirkpatrick's model. Secondly, ROI calculations 'for the first time was very time-consuming and a somewhat disconcerting' and that it is an area 'where "science and art" move hand in hand' (Habershon 1999, 21). Thirdly, the author recommends 'that the process is speeded up to take account of the learning already achieved, and minimize the impact of the inevitable "churn" in participating members – a one-year project limit should be established' (Habershon 1999, 21).

PricewaterhouseCoopers (PwC) (2010), one of the world's largest consultancy firms, has found that estimations of training and development costs are rarely scrupulous and rigorous. PwC states that companies actively pump money into corporate education, but have a vague comprehension about return on training and development. Quite often, management even is not aware about training expenditures. That is why it is no surprise when educational programs become a first victim of cost reduction campaign when a company faces downturn. Using a methodology developed by Saratoga Institute (belongs to PwC), PwC did an analysis of massive quantitative data (more than 100 key, dependent and operational indicators) obtained from dozens of Russian and European companies operating in diverse industries. PwC reports that ROI into personnel in Russia and Europe vary considerably and amount to 2.7 (270%) and 1.2 (120%) respectively. However, PricewaterhouseCoopers (2010) does not clarify what kind of investments into personnel have been taking into account, i.e. whether they are training and development investments only, or other staff-related expenses and perks.

CONCLUSIONS

The in-depth and attentive review and analysis of literature dedicated to the training evaluation approaches have revealed the following critical points:

- Estimating return on training is gaining more and more attention among management and HR professionals, especially in the light of transition to the knowledge-based economy.
- Calculating ROI has been an issue for almost three decades and has not been solved yet.
- Literature on ROI is rather theoretical giving general guidelines and recommendations.

- To date there are two well-known models applying for evaluating training benefits: four-level Kirkpatrick's model and five-level evaluation process developed by Jack J. Phillips.
- Models offered by D. Kirkpatrick and J. Phillips are very similar and can be considered as qualitative, since they do not provide any algorithms for calculating ROI.
- Calculating training expenses is much easier than benefits.
- 'Hard skills' training outcomes are easier to be quantifiable.
- Majority of companies calculate ROI retrospectively, i.e. after investments have been already made.
- ROI calculations have been done mostly in the developed countries.
- No consistency and subjectivity in measuring and calculating ROI as well as low response rate of relevant questionnaires reduce the credibility of results and their generalizability.
- Presumably, companies do not report weak (low) ROI results.
- Available ROI formula is too simplistic and static.
- ROI formula is not dynamic; it does not take into account such important variable as time.
- ROI case studies showed that estimations do not take into account the probabilistic nature of events. Therefore, the estimations cannot be adequate.
- ROI estimations found in the literature are based on retrospective analysis of tremendous arrays of statistical data, that, however, are absent or not accessible in many companies due to various circumstances.

Therefore, the conducted literature review and analysis have identified a gap between the demand for practical techniques for adequate estimating return on training and the existing theories and approaches. The highlighted weaknesses of the reviewed methods can be considered as the topics for future studies aiming at developing advanced approaches to evaluating return on training.

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