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RETURN ON TRAINING (ROT): AN ADVANCED YARDSTICK FOR ESTIMATING AND MEASURING HIGHER EDUCATION INSTITUTION AND BUSINESS SCHOOL PERFORMANCE IN KNOWLEDGE-BASED ECONOMY

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Abstract
Return On Training is a hot topic among training professionals. The purpose of this paper is to present a stochastic simulation model developed for estimating and predicting monetary return on investment in corporate training. The article highlights new opportunities and challenges brought to the higher education institutions and business schools by internationalization and globalization. This study points out the weaknesses of the traditional criteria for measuring success and performance of education institution and offers Return On Training (ROT) as an advanced yardstick for measuring and benchmarking training programs outcomes. The research covers the key aspects of computer-based simulation modeling, underlines its advantages, proposes theoretical framework for studying ROT and finally comes up with a mathematical formula for calculating ROT that can be easily implemented as a computer software application.

Keywords
return on training, ROI of training, training evaluation, human capital, knowledge management.

Introduction

"What cannot be measured cannot be improved."

Unknown author

Higher Education Institutions (HEIs) and business schools are strategic and indispensable participants in forging highly-educated staff equipped with diverse knowledge, competences, skills and accumulated experience of previous generations.

To become a trusted training service provider for corporate segment, HEIs and business schools should be able to adapt and improve their programs to meet constantly changing business requirements. For this purpose, educational institutions have to revise their performance criteria and to introduce new metrics that will help to master a financial language for better communication with the business world.

This paper outlines the changing role of existing indexes gauging HEI and business school performance, highlights their waning importance and offers a new yardstick – Return On Training (ROT) – that could be a universal criterion for measuring monetary training results in the context of globalization and internationalization. The key feature of this research is that "ROT calculator", a stochastic computer-based simulation model, predicts return on training before it has been conducted, since the majority of ROT calculations are done retrospectively [1].

Having identified the weaknesses of the traditional positivistic methodologies in the context of the evaluating and predicting ROT, the article briefly covers the basics of computer-based simulation modeling. It presents the developed theoretical framework for studying ROT resulted in key mathematical

formula that was implemented in the form of "ROT calculator", a Windows application.

Internationalization and globalization: new opportunities and challenges for higher education institutions and business schools

HEIs and business schools experience the ongoing globalization process that brings not only a huge potential for further growth and development but various challenges as well.

On the one hand, internationalization opens new markets and business opportunities for both HEIs and business schools providing educational services for local and international corporate clients (e.g. degree programs and non-degree trainings such as Open Enrollment Program in Corporate Finance, Executive Development Programs).

On the other hand, globalization, deregulation, new and agile market entrants as well as easy Internet access create an unlimited number of learning options for corporate trainees in terms of training type (e.g. on-site and remote), duration (degree or non-degree program), location of HEI and training costs, of course. For instance, a Russian or Chinese branch of multinational company can send its employees for a customized training developed by a business school located in USA, Europe or Australia.

Under the circumstances HEIs and business schools are facing the increasing cutthroat competition and therefore must respond to these challenges not only by revising their governance structures, introducing new teaching approaches, offering flexible standard and tailored degree and non-degree programs, but also by reconsidering the existing metrics for gauging their success and performance and by introducing new criteria that would facilitate a comprehension of training value for top management who still considers training expenses as costs, not human capital investments.

Traditional criteria for measuring success and performance of business schools

The analysis of the relevant official web pages, educational fairs and e-mail advertisements reveals that overwhelming majority of business schools make a special accent on global rankings and international accreditations of their institutions and programs. In addition to it, some institutions also mention ISO 9001 Certification (Quality Management Systems Requirements), diversity of the students and faculty, total number of alumni, annual volume of graduates, average or median salary after graduation. Therefore, from business school's point of view, all above mentioned indicators measure its prestige and success, and must attract new applicants.

However, from company's perspective, basing on the metrics offered by business schools, it is not easy and unclear to determine which training program would have better payback: a standard program designed by a top school or a customized training offered by a smaller institution but with a proved competence in this specific area?

Apart from difficulties of coping with many metrics measuring business school success and performance, and predicting tangible outcomes of a particular program, HEIs in general and business schools in particular must admit that due to constantly changing business landscape some measures are becoming obsolete and irrelevant. An up-to-the-minute survey on the future of business education proves that when measuring the success of business schools, 70% and 65% of respondents consider salary increase and school's ranking 'largely irrelevant', respectively [2].

Therefore, HEIs and business schools must consider educational programs as a product that brings a certain tangible and measurable value to the customer, namely organization that expects a certain monetary payback from training investments. Return On Training (ROT) could be a yardstick, a common denominator that establishes a benchmark for measuring and comparing performance of business schools and help them to stand out in a crowd by offering trainings programs with better ROT.

Return on training (ROT): key performance indicator for measuring and benchmarking training programs outcomes

Importance and challenges of estimating and predicting ROT

Continuing economic uncertainty and severe austerity measures across the globe force companies either to cut training expenses or to be very meticulous in choosing a training product that bring tangibles results in the short run.

On the one hand, many studies report a positive correlation between investments into personnel training and development, and the bottom-line results that inspire organizations to pump millions of dollars into human resources training.

On the other hand, in most cases companies are still not able to estimate ROT beforehand for better allocating training budget and choosing a proper training program aligned with the corporate strategy. Management has a vague comprehension about ROT, and, quite often, it 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 [3].

Therefore, a healthy pragmatism of managers requires a tool for estimating ROT in advance, just as investors forecast ROI into assets taking into account possible risks.

In the context of knowledge-based economy ROT attracts a growing attention among management and HR professionals. However, calculating ROT has been an issue for almost three decades and has not been solved yet. Existing methods and formula for estimating ROT are too simplistic, static and do not take into account the probabilistic nature of events. In addition to it, available ROT calculations have been done retrospectively, i.e. after the training program has been delivered [4].

To address the problem of predicting ROT, extensive literature review and analysis of empirical studies measuring ROI of training (for more details please refer to the EFMD Report indicated in the References) have been done that resulted in development of a stochastic computer-based simulation model for calculating ROT.

The following sections will provide a reader with the research results including difficulties of applying traditional methodologies, the key aspects of computer-based simulation modeling, and give detailed explanation of the conceptual model and final mathematical formula developed for studying ROT.

The next research phase that is underway is testing and fine-tuning this model in the real settings by asking for relevant data from business schools and companies through questionnaire. Therefore, the empirical model will allow both business schools and organizations calculating ROT before and during development of the training programs, making correction actions to keep risks and expenses under control and benchmarking.

Weaknesses of the traditional positivistic methodologies in the context of the given business research

Basing on the results of the extensive literature review covering the aspects of training evaluation, inputs from the managers having access to the corporate sensitive information, and previous personal experience during the MBA studies, it has been identified the following barriers that make the traditional positivistic methodologies inappropriate for this doctorate research performed by the author:

1. No or limited access to the commercially sensitive information.
2. Lack of financial and personnel-related statistics in the context of evaluating a payoff from training investments.
3. Low reliability of data provided due to inability to guarantee anonymity to the respondents disclosing a proprietary information.
4. Shortage of resources available (budget, manpower, and time span of the doctorate research) to conduct either full-scale cross-sectional or longitudinal studies.
5. Inability to conduct experiments in the real organizational setting for an external researcher such as a doctorate student.

The first issue is probably the most significant obstacle for obtaining data required to evaluate the ROT. Financial data (projected and actual revenues and net profits, training costs) and human resources records (age, turnover, absenteeism, accidents) are well protected and managers are very reluctant to disclose it.

A lack of relevant statistics has also significantly decreases the availability of data. There are many evidences indicating the above mentioned barriers for data collection: "Companies will rarely give commercially sensitive information and in many cases may not have suitable records to allow them to give the required data" [5]. Collis and Hussey have also confessed the difficulties in obtaining in-company data, but strongly advise not to get information from insiders whom you know without prior written official approval [6].

Werner Sengenberger, the former Director of Employment and Training Department in International Labour Office, in his preface to the book by Grubb and Ryan has also underlined the fact that it is not easy to obtain meaningful financial statistics and expressed doubts in the very existence of such data [7].

Even big projects with proper funding, manpower and advanced access to the data experienced the above mentioned issues. For instance, a GLOBUS project had a purpose of developing a computer simulation model in order to study various important macropolitical and macroeconomic relationships within and among 25 prominent contemporary countries and other entities. This model was employed to find solutions to long-term global issues, and therefore it was required to obtain diverse data. Karl W.

Deutsch has highlighted the time-consuming process of data search and a lack of adequate data for various economic data such as income distribution they were experiencing during the development of GLOBUS model [8].

Therefore, we can conclude that there is a unanimous opinion regarding inability of obtaining financial and other corporate statistics.

The third identified weakness of the traditional positivistic methodologies deals with the surveys, namely with the high risk of losing anonymity during obtaining data via questionnaires.

The deficiency in resources is the fourth obstacle that might encounter small- or medium-sized companies, let alone a doctorate student who conducts business research alone and usually does not share all incurred costs with anybody else. Therefore, it is vital to find a suitable research approach that will answer a research questions with acceptable precision and at the same time make studies feasible in terms of expenditures and time needed.

Last but not least is inability to conduct experiments in the real companies. Experimental studies are very effective in doing research in natural sciences, however, many authors argue that such positivistic methodology is less suitable for conducting studies in social sciences. There is an opinion that "In business research it is difficult to arrange experiments. Furthermore, laboratory settings do not reflect the actual environment" [9].

Jackson states that complex real-world problems of social systems cannot be easily analyzed and solved by the methods of natural sciences. He also stated that "repeatable experiments are hard to carry out on real-world problems when initial conditions are impossible to replicate and using experiments involving people or social systems can in any case be ethically problematic" [10].

Computer-based simulation modeling

What model is

There is plenty of definitions and interpretations of the *model* concept. For instance, Wasson defines model as "a virtual or physical representation of an entity for purposes of presenting, studying, and analyzing its characteristics such as appearance, behavior, or performance for a prescribed set of operating environment conditions and scenarios" [11].

In the light of systems theory as a methodological approach to the study of very complex structures or systems, they can be considered as "*mental constructs* or *models* of a specified part of reality", that are able "to assist in the production of knowledge about this part of reality" [12].

Therefore, the model is a substitution of a real object or a system that enables researcher to analyze it, generate a new knowledge and make some projections and general trends regarding its behavior in the future.

In many cases, especially in the study of social systems that imply involvement of people, modeling is the only available method to conduct research without causing harmful effects and violating ethical principles. Most of the modern organizations are very complex social systems that can be studied and researched using computer-based simulations.

Simulation

Simulation is the imitation of a real-world system to duplicate its functioning and thus to comprehend it, at least partly, and generate a new knowledge about it. Gigch states that "duplication affords the opportunity to study the system away from its original setting" and therefore, brings researcher a great degree of flexibility in doing a research even without having a subject under study in hand [13].

Simulation can be conducted "through mathematical models, computer models, mock-up and template models, and so on" [14]. However, computer-based simulation is becoming very popular in business research as "an alternative to lab and field experimentation" [15]. It also serves as quite effective managerial decision-making tool in quite complex and uncertain business situations.

Success of simulation modeling has been established due to the following five key developments [16]:

1. Massive increase in the data availability including diverse aggregated statistical data that facilitates the identification of more correlations, cross-sections and configurations.
2. The amount of confirmed *existential statements* ("there is" or "if ... then" statements) from social science has considerably increased.
3. Growing application of mathematical and statistical methods in the social sciences.
4. Ongoing growth of computer performance in terms of speed, memory size and computing power.
5. Development of the models depicting complex and large-scale systems in both natural and social sciences.

Using simulation for modeling businesses allows managers to generate and analyze various events that could happen in the real life. Davis *et al.* concluded that "simulations can offer a wealth of knowledge as the researcher can experiment with different and novel situations" [17].

Advantages of the computer-based simulation

At this juncture computer-based simulation is one of the most popular research approach in various

sciences. Bremer explains why it has happened by referring to the following potential advantages identified by Meadows and Robinson [18]:

1. Rigor (no ambiguities are possible).
2. Comprehensiveness (computer's ability to manipulate tremendous volumes of information).
3. Logic (computer's ability to draw logical and error-free conclusions).
4. Accessibility (computer models can be easily examined, evaluated and revised).
5. Flexibility (substitution of the real social experiments that are very costly and time-consuming).

Of course, each of the above mentioned advantages has a negative side. Nevertheless, in Bremer's view, "the strengths of computer simulation outweigh its weaknesses" [19].

Types of simulation models

In general, simulation models can be of two types: *deterministic* and *stochastic*.

According to Wasson [20], *deterministic models* are based on certain relationships between system's elements that produce repeatable and predictable outcomes.

Stochastic models are based on probability theory to process a set of random event occurrences. Thus, "*stochastic* models are constructed using data from statistically valid samples of a population that enable us to *infer* or *estimate* results about the population as a whole" [21].

Stochastic models are better suited to describe and study the real-world business problems, because they involve a lot of random and uncontrollable events and effects such as "environmental conditions and events, human reactions to publicity, and pharmaceutical drug medications" [22].

Olsson and Sjöstedt also argue that "in most cases response behavior is partially unknown due to lack of knowledge or because it is intrinsically undeterminable (free will, genuine uncertainty, etc.)" [23].

Therefore, in the context of this business research, the evaluation of return on investments into corporate training will be based on stochastic computer-based simulation model.

Needless to say, that a computer-based simulation technique is not a panacea for solving all complex business problems. Neither does it replace traditional positivistic methodologies. However, its effectiveness and applicability in various areas make simulation modeling on of the must-have managerial decision-making tool.

In conclusion, it is worth to quote the following passage from the foreword of Karl W. Deutsch to the Bremer' book:

"Computer models permit projections, not predictions. At best, they can show general trends, not specific outcomes for any particular year, altogether they may indicate the probable region in which such outcomes are likely to be located. Even then, important processes in the real world may have remained unrepresented, or represented unrealistically, in the model. Even complex models, therefore, leave room for error and need improvement. All that can be said for them in these aspects is that the costs of ignorance or error in public policy might be higher in the absence of such models" [24].

Developing theoretical framework for studying return on investments in training

The need for a theoretical framework

Literature survey and research problem definition are followed by the development of a theoretical framework that is "a conceptual model of how one theorizes or makes logical sense of the relationships among the several factors that have been identified as important to the problem" [25].

Theoretical framework (or conceptual model) describes and discusses the interrelationships among the variables that are relevant to the questions being under study and have been identified through the time-consuming literature review, surveys, interviews and other research-related activities [26].

Theoretical framework is a basement for the whole research and provides a researcher with a capability to develop and test hypotheses in order to examine a theory formulated by the investigator. Basing on the developed conceptual model, a manager is able to generate various least and most probable scenarios, to estimate their aftermath and hence to allocate available organizational resources in accordance with the corporate objectives.

Sekaran states that any theoretical framework must have the following five basic features [27]:

1. Basing on the explanation provided, variables relevant to the research must be identified and labeled.
2. Important interrelationships among variables should be clearly stated.
3. Basing on the previous research, the nature and direction of these relationships (positive or negative) must be indicated.
4. Stated relationships must be explained using previous research findings.
5. Theoretical framework should be depicted as a schematic diagram that helps the reader to understand the theorized relationships.

In sum, developing a theoretical framework is indispensable step in the research process, and any rigorous and trustworthy research must involve developing a theoretical framework that incorporate the above mentioned five basic features.

Identifying, labeling and describing the important variables

The first step towards creating a meaningful theoretical framework is identifying the key variables that are most relevant to the subject under study.

It hardly needs to be said that identifying and sorting out the most critical factors influencing and contributing to the research problem can be done only after extensive literature review and meticulous analysis of the previous study close to the current research.

Having reviewed dozens of various books, articles and reports on training evaluation and calculating return on investments into training and development activities, it has been identified plenty of elements and factors that have an impact on the ultimate quantifiable value of the Return On Training (ROT).

However, it is not feasible to take into account all variables of diverse nature that most likely contribute to the ROT. Hence, reducing the number of variables relevant to the topic of interest becomes a critical issue while developing a manageable and understandable conceptual model for calculating ROT.

Applying a parsimony principle, that is a hallmark of a scientific research, helps researcher to narrow down an array of variables by choosing "a lesser number of variables that would explain the variance far more efficiently than a complex set of variables that would only marginally add to the variance explained." Therefore, parsimony secures "economy in research models" and "simplicity in explaining the phenomena or problems that occur" [28].

Basing on the literature survey and keeping in mind the purpose to design a meaningful and parsimonious theoretical model for evaluating ROT, the following six variables have been identified and labeled accordingly:

1. *Total Training Costs* – Total training costs incurred (direct and indirect) due to training of company's employees.
2. *Expected Monthly Training Benefits* – Expected monetary training outcomes received every month within the duration of the training effect that expressed in months.
3. *Expected Duration of Training Benefits* – Expected time interval within which a company will obtain every month an expected monthly training benefits.
4. *Annual Discount Rate* – Annual interest rate taking into the time value of money.
5. *Annual Turnover Rate* – Percentage of employees who left a company (both voluntary and forced) during a calendar year. Temporarily and employees contracted for less than a year are not taken into account.
6. *Return On Training* – Return on investment into training activities arranged for the organizational personnel that is calculated for the time period equal to the expected duration of training benefits.

Using the classification of the variables stated by Sekaran, all six variables have been assigned the following types [29]:

- *Return On Training* is the dependent (criterion) variable that is of primary research interest.
- *Total Training Costs*, *Expected Monthly Training Benefits*, *Expected Duration of Training Benefits* and *Annual Discount Rate* are the four independent variables influencing the criterion variable which is *Return On Training.*
- *Annual Turnover Rate* is the moderating variable.

In sum, basing on the literature review and analysis, and following the parsimony guidelines, six variables (including one dependent, four independent and one moderating) of the theoretical framework have been identified, labeled and described.

The rationale of choosing these variables, as well as their interrelationships in the context of evaluating ROT, will be explained in detail in the next section.

The nature and direction of the interrelationships among the identified variables of a theoretical framework

Literature survey has revealed that overwhelming majority of researchers involved in the challenging task of evaluating tangible benefits resulted from training refer to the well-known but simple and static ROI formula that has been derived from the financial realm [30–33].

This formula has several variations that, however, are equal mathematical expressions for calculating return on investments into training. For instance:

$$ROI = [Program\ Benefits\text{-}Program\ Costs]/ Programs\ Costs\ , \tag{1}$$

$$ROI(\%) = [Total\ Net\ Training\ Benefits/ Total\ Training\ Costs] \times 100, \tag{2}$$

$$ROI = Results/Training\ Costs. \tag{3}$$

Therefore, basing on the above mentioned, the three following variables have been clearly and logically identified and labeled:

- *Return On Training* (**ROT**) – dependent variable.
- *Total Training Costs* ($\boldsymbol{C}_{\sum}$) – independent variable.
- *Expected Monthly Training Benefits* ($\boldsymbol{B}_{\mathbf{monthly}}$) – independent variable.

Total Training Costs include all direct and indirect learning-related expenses expressed as a monetary value (e.g. Euro, USD, or other currency). For instance, cost of formal training program and the trainee's salary are the major direct costs, and lost productivity during training is considered to be the indirect training expenses [34].

Expected Monthly Training Benefits are possible positive results from training that have been converted into the cash inflows a company is going to receive in the future. Such benefits are cost savings, increases in sales, decreases in accidents, production growth [35].

It is worth to notice that identifying all costs and benefits and turning them into quantifiable figures are complicated and laborious processes that also deal with obtaining very sensitive and confidential information to be disclosed in order to get credible estimation of ROT.

Therefore, getting numerical values for these two independent variables (*Total Training Costs* and *Expected Monthly Training Benefits*) is out of scope of this research project. These input data must be prepared by HR specialists in close cooperation with other relevant company's departments. Evaluation of both training costs and benefits is based on analysis of vast arrays of hard and soft data available [36].

Relationships among **ROT**, $\boldsymbol{C}_{\sum}$, and $\boldsymbol{B}_{\mathbf{monthly}}$ are quite straightforward. The greater the accumulated expected monthly training benefits, the greater is the return on training ROT. Conversely, the greater the total training costs, the less is the training payback (ROT).

Literature survey has pinpointed that calculating training expenses is much easier than benefits. Since benefits can only be predicted and estimated roughly basing on combinations of strict calculations, previous experience and managers' hunch, then total training costs will be constant throughout the simulation cycle, while a monthly benefit will be a subject to stochastic variations defined by a distribution law.

It is also necessary to underline, that expected benefits resulted from the training are aggregated, i.e. the *unit of analysis* is a *group* of trained people, not each *individual*, since it will facilitate collecting data, especially financial data, namely salaries, because HR will disclose the total salary figure easier than the payroll for each employee.

There are another two independent variables that take into account the time factor. Below are they:

- *Expected Duration of Training Benefits* ($\boldsymbol{D}_{\mathbf{benefits}}$)– independent variable.
- *Annual Discount Rate* ($\boldsymbol{r}$) – independent variable.

It is obviously that usually training benefits do not occur once at one particular point in time only. Organization can receive benefits from training at various points stretched along the timeline. This time period or "duration of a training program's effect on employees" directly influences the ROT [37].

It also must be taken into consideration, that defining a time period $\boldsymbol{D}_{\mathbf{benefits}}$ for which a ROT is calculated is a quite challenging task [38].

Annual Discount Rate ($\boldsymbol{r}$) reflects the Time-Value-of-Money Principle, i.e. that "the value of a cash flow depends on when it will occur" [39]. Therefore, all training benefits occurred at different points of time must be discounted using the present-value factor that is equal to $[1/(1+r)^n]$.

Flamholtz has also applied the Time-Value-of-Money Principle while estimating the value of human resources to a firm [40].

In the context of the theoretical framework's interrelationships among variables, the greater the expected duration of training benefits, the greater is the return on training ROT. Conversely, the greater the annual discount rate, the less is the value of the ROT.

The last, but extremely important, identified variable is the *Annual Turnover Rate* ($\boldsymbol{T}_{\mathrm{p.a}}$). This variable has been classified as the *moderating variable*, because it "has a strong *contingent* effect on the independent variable-dependent variable relationship" and "modifies the original relationship between the independent and the dependent variables" [41].

Turnover rate is very frequently cited factor that could have a strong negative impact both on tangible company's results (e.g. bottom line) and intangible aspects of the organizational health (e.g. employees' morale).

Joyce and Woods mentioned Turnover Ratio as a key performance indicator among other human resource indicators such as employee morale and employee competence measures [42].

EFMD also highlighted the importance of Turnover Rate in estimating ROI of training [43]. Phillips considered Employee Turnover as a part of a company's work climate [44]. Flamholtz studied various types of costs comprising human capital cost: among them is Turnover Cost that depends on anticipated tenure or turnover rate [45].

If employees who have taken part in training leave a company within the expected duration of training benefits, then a company will not reap the expected training benefits resulted from new skills, knowledge and competences of the trained staff.

In knowledge-based economy, where a human capital is the main asset and the key revenue generator, turnover could significantly deteriorate the ROT. Therefore, the greater the annual turnover rate, the less is the return on training (ROT).

Usually, companies are reluctant to disclose the actual figures of the *Annual Turnover Rate* ($T_{\text{p.a}}$). To overcome this issue, two options for defining a Turnover Rate will be available: assigning a certain value of a turnover rate for each month (τ_n) basing on a company's historical records or describing a Turnover Rate by using its mean value and standard deviation and assuming that Turnover Rate is normally distributed.

The described interrelationships among all six variables are diagrammed in Fig. 1.

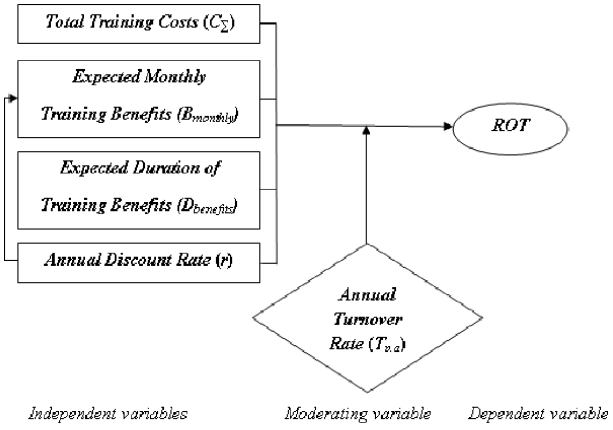

Fig. 1. Theoretical framework for predicting Return On Training.

Figure 2 explains the dynamics of interrelationships among variables on the time line.

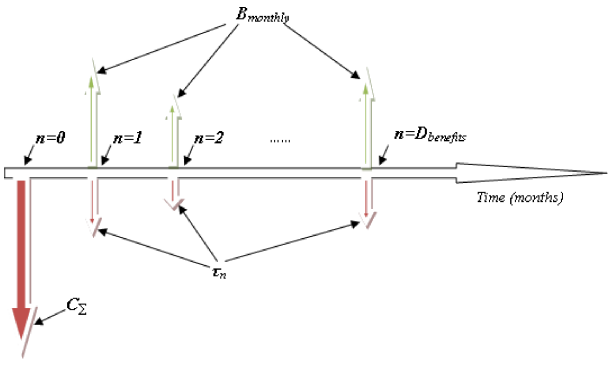

Fig. 2. Dynamics of interrelationships among variables on the time line.

The basic mathematical formula for calculating Return-On-Training

Computer-based simulation model for calculating ROT requires the mathematical formula that accumulates and presents all relationships among variables that have been identified and described earlier. The input data needed for obtaining ROT can be divided into two groups:

- Deterministic: $\boldsymbol{C_\Sigma}$, $\boldsymbol{D_{\text{benefits}}}$, $\boldsymbol{r}$,
- Stochastic: $\boldsymbol{B_{\text{monthly}}}$, $\boldsymbol{T_{\text{p.a.}}}$

Assuming that $\boldsymbol{B_{\text{monthly}}}$ and $\boldsymbol{T_{\text{p.a.}}}$ variables are normally distributed, their monthly values can be obtained using a random-number generator that receives a mean and a standard deviation of a variable and outputs its normally distributed value. Therefore, both *Expected Monthly Training Benefits* ($\boldsymbol{B_{\text{monthly}}}$) and *Annual Turnover Rate* ($\boldsymbol{T_{\text{p.a.}}}$) must be determined by assigning relevant values to the mean and the standard deviation.

Basing on the above mentioned assumptions, the basic mathematical formula for calculating Return-On-Training looks like as follows:

$$\text{ROT} = \left[\frac{\left(\sum_{n=1}^{\mathbf{D_{benefits}}} \frac{1}{\left[1+\frac{r}{12}\right]} \times \mathbf{B'_{monthly}}_n \times \left(1-\frac{\tau'_n}{100}\right)\right) - C_\Sigma}{C_\Sigma}\right] 100,$$

where

$\boldsymbol{B'_{\text{monthly}}}_n$ – expected monthly training benefits for the $\boldsymbol{n}^{th}$ month;

$\boldsymbol{\tau'_n}$ – expected monthly turnover rate for the $\boldsymbol{n}^{th}$ month.

$\boldsymbol{B'_{\text{monthly}}}_n = f(\boldsymbol{B'_{\text{monthly}}}_{MEAN}, \boldsymbol{B'_{\text{monthly}}}_{ST.DEV}, \boldsymbol{n})$ – i.e. calculating the value of the expected monthly training benefits needs three parameters: mean and standard deviation of this variable and the number of a current month for which monthly benefits are being calculated.

$\boldsymbol{\tau'_n} = \frac{\mathbf{T'_{p.a.}}}{12}$, $\mathbf{T'_{p.a.}} = f(\mathbf{T'_{p.a.}}_{MEAN}, \mathbf{T'_{p.a.}}_{ST.DEV}, \boldsymbol{n})$ – i.e. calculating the value of the expected monthly turnover rate needs three parameters: mean and standard deviation of this variable and the number of a current month for which monthly turnover rate is being calculated.

Mean and standard deviation for generating numerical values of monthly benefits and monthly turnover rate are the input parameters that are specific for each company and must be provided by human resource departments using historical data or an educated guess.

Conclusions

The current measures and determinants of HEI and business school performance do not meet corporate customers' expectations who want to see measurable training results. HEIs and business schools must prove the value of the training project or program for potential learner by developing so-called Business Case that "determines what business benefits are to be released through the project and when" [46].

Thus, "ROT calculator" basing on the developed computer-based simulation model could be a key element of such Business Case that establishes a common language for both business schools offering education services and organizations that can see more clearly training results from investments into the most valuable asset – human beings.

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