Training, knowledge, competence, performance: What is the relationship?

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Abstract

In-company training is not a temporary fashion of the last decades but a product of continuous development with the roots tracing back to ancient Egypt, where sons continued the crafting professions of their fathers and learned directly from them the required knowledge and competencies. In the second half of the 18th century, the industrial revolution caused rapid technology development and, with it, the rise of modern industrial enterprises. As a result, the demands on employee competencies have become more complex, and companies have become increasingly interested in developing the workforce under their own direction. These developments raise a critical question: How does employees' participation in in-company training really impact performance? This research aims to analyze available theories on investment in in-company training, knowledge and competence formation, and performance of employees in the workplace as well as to explore empirical relations between these four variables. The findings show that the theoretical and methodological diversity of analyzed theories and empirical studies is quite large yet still limited. Numerous scientists have tried to explain relations between "training" and "employee performance" and to operationalize the latter. However, the relations and interdependencies between in-company training, knowledge, competence and performance of employees in the workplace have rarely, if ever, been explored thus far, and the economic efficiency of in-company training continues to be among the unknowns. The results of this first stage will be used to develop a theoretical framework for empirical research on the relationship between in-company training, knowledge, competence and performance of employees in the workplace.

INTRODUCTION

Volatility, Uncertainty, Complexity and Ambiguity (VUCA) characterize the environment of knowledge-intensive organizations today. The market and customer requirements regarding innovation, quality, financial services and flexibility are increasing constantly. The "survival of the fittest" demands those organizations act as living organisms and adapt to environmental changes. It is no longer sufficient for them to think that the employees' competencies at the time of recruitment will meet future demands. New technologies are rapidly transforming job landscapes and reshaping the way people work within organizations. In 2015, at the World Innovation Summit for Education, the results of the Lumina study on higher education in the United States were presented. One of the findings was that 89% of business leaders did not agree with the statement that "higher education institutions in this country are educating students with skills and competencies that my business needs" (Gallup, 2014; Ozyurek & Uluturk, 2016). What is crucial for organizations is not who is the most proficient in designing a drawing or making a competitor analysis but instead, the social competencies an employee possesses are what matter most (Bhalerao, 2016; World Economic Forum, 2016).

One of the world's leading technology companies, Siemens AG, has recorded since 2009 a training investment growth of 16%. In 2017, it amounted to 266 million euros, an average of 735 euros per employee (Siemens, 2018). A leading Australian resource company, BHP, provided on average 43 hours of training to each employee in 2017 (BHP, 2017). In Gazprom, the largest producer and exporter of liquefied natural gas from Russia, 73% of employees were...
trained under enhancement and retraining programs in 2017 (Gazprom, 2017). It is estimated that corporations spent in 2017 around 362 billion US dollars on corporate training activities worldwide (Statista, 2018).

In addition to companies, also political, economic and social institutions underline the economic importance of continuous training. The fourth sustainable development goal of the United Nations of the 2030 Agenda for Sustainable Development aims to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations Educational, Scientific and Cultural Organization, 2017). Education and training also receives paramount attention in the European 2020 strategy. The target is 15% for adult participation in lifelong learning (European Commission, 2013).

This behaviour raises the following question: Is in-company training a truly sound “investment” which leads to higher employee performance, or is it more a “luxury good” with a cost disproportionate to its positive impact? To answer the research question, the paper is divided into five sections. The second section describes the chosen methodological approach. The third section presents a review of the theoretical concepts related to four variables: in-company training, knowledge and competence formation, and employee performance in the workplace. The fourth section demonstrates an analysis results of existing empirical studies on effects of in-company training. Conclusions and a future research proposal on the relationship between the four variables are performed in the fifth section.

**CONCEPTUAL FUNDAMENTALS**

This chapter explores the trail of human capital theorization from a microeconomic perspective as a part of economic theory. It focuses on explanation of the variables “in-company training”, “knowledge”, “competence” and “employee performance in the workplace”. Consequently, it examines the related gaps and issues in theoretical literature.

**Training as an Aspect of Human Capital**

Chicago School representatives, (Becker, 1993; Mincer, 1962; Schultz, 1961, 1972), integrated the Human Capital Theory into economic analysis and developed it substantially. The focus of their analyses was related to the microeconomic approach and targeted to the investment in human beings, e.g. in knowledge acquisition through training. This kind of investment involves costs and benefits and can, therefore, be elaborated under investment-theoretical aspects as economic decisions.

Mincer’s analysis was related, inter alia, to the allocation of resources to training. He used his research results to explain the earnings inequality and behavior of different groups of workforces (Mincer, 1962). Related to earnings inequality, he concluded that “the inequality in the distribution of earnings is affected primarily by the dispersion in the amounts of human capital invested and by the average magnitude and the dispersion in the rates of returns” (Mincer, 1975). The results of his analysis led to the conclusion that a more educated workforce receives higher wages and enjoys higher employment stability than a less educated workforce (Mincer, 1975).

Schultz perceived that training is an investment in human capital that leads to higher future income (Schultz, 1961). He focused on five categories of investment in human capital: health services, training organized by firms on the job, formally organized education, study programs for adults not organized by firms and migration (Schultz, 1961). The results of his analyses were that all these investments improve skills, knowledge and health, and thereby raise income level (Schultz, 1972). In his later research, Schultz noted some of the limitations of his previous work as well as unrealistic assumptions of neo-classic theory such as perfect competition (Schultz, 1972).

Like Schultz, Becker considered human capital as a product of investment in education, training, etc (Becker, 1993). In addition, he provided a distinction between general and specific human capital in order to conduct more specific analyses on investment in on-the-job training. According to his theory, a rationally operating company will only invest in company-specific human capital, because it can be used profitably more in this company than in others. Becker’s research showed that more highly educated and skilled persons almost always tend to earn more than others. However, his statement is not universal and there are differences between developed and underdeveloped countries (Becker, 1993). In addition, Becker observed that investment in human capital leads to increased employee productivity and this, in turn, results in an improved income situation. This observation was related to the United States and assumptions were based on perfectly competitive labor markets and instruments (Becker, 1993; Chong & Lee, 2017; Karim, Elyas, Mahmood, & Hossein, 2017; Kurniawati & MeilianaIntani, 2016). Conversely, Acemoglu and Pischke, demonstrated that a company can have an interest in investing in general human capital. The reasons for this are asymmetric information, complementarity of general and specific human capital, etc (Acemoglu & Pischke, 1998).

Training as a component of human capital was defined by a number of authors and to emphasis the diversity of definitions, some of them are presented in the Table 1.
Despite differences in definitions, all of them imply that training is a systematic process which targets outcomes in knowledge, skills, abilities, competence, behavior and attitudes.

In line with the research question, the focus lies on a particular component of human capital, which is accumulated during market participation through “in-company training”.

Knowledge as a Component of Human Capital

The question on importance of knowledge has occupied much attention in economic and management theory. In economic theory, (Hayek, 1945; Schumpeter, 1991), elaborated on the economic role of knowledge. Hayek argued that knowledge is largely tacit and acquired through practice, and hence different people have different knowledge despite obtaining the same data and information. He considered knowledge as highly subjective and not separable from individuals who possess it (Hayek, 1945). Schumpeter emphasized the cruciality of explicit knowledge combination and referred to the creative role of knowledge in innovations. He defined innovation as an entrepreneur’s doing of something new or doing something in a new way (Schumpeter, 1991). Drucker (1999), Nonaka and Takeuchi (1996), North and Kumta (2018) considered the essential role of knowledge in their management theories. Drucker stepped into the shoes of Schumpeter by elaborating further on knowledge-based innovations. He described this type of innovation as the crème de la crème of entrepreneurship and reasoned that knowledge workers need to learn continuously and acquire new knowledge to be innovative (Drucker, 1999). Table 2 shows some selected definitions of how is knowledge defined.

The provided definitions describe various elements of knowledge and show with this that knowledge is not a simple one-dimensional element. In addition, to those definitions, Polanyi deeply analyzed tacit and explicit knowledge dimensions. “[...] tacit knowing is the fundamental power of the mind which creates explicit knowing, lends meaning to it and controls its uses” (Polanyi, 1966). He concluded that there is no clear separation between tacit and explicit knowledge, but the tacit dimension is a crucial fraction of all knowledge. “[...] all knowledge is either tacit or rooted in tacit knowledge” (Polanyi, 1966)

According to the Nonaka’s and Takeuchi’s theory, knowledge is created through interaction between the tacit and explicit dimensions. Authors determined 4 knowledge con-
conversation processes: socialization, externalization, internalization and combination. Socialization is the process of creating tacit knowledge through experience, e.g. an employee can acquire tacit knowledge through training. Externalization is a process of transforming tacit knowledge into the explicit dimension. For example, by using the tacit knowledge, employees may create new product designs. Internalization is the process of knowledge conversation from explicit to tacit. Through internalization, employees are capable of using knowledge they have experienced to build new concepts. Combination is the process of combining different forms of explicit knowledge together. Within organizations it can occur when employees exchange documents (Nonaka & Takeuchi, 1996).

To explain knowledge-based value creation within an organization, North and Kumta developed “The Knowledge Ladder”. It visualizes clear interrelation for terms like symbols, data, information, knowledge, action, competence and competitiveness and shows how knowledge is related to competence. The authors differentiate between three levels of knowledge: “know what”, “know why” and “know how”. “Know what” is the result of information internalization, e.g. through participation in training. “Know how” is the result of transformation of “know what” through application. “Know why” is specific motives to apply knowledge (North & Kumta, 2018). The focus of this research is tacit and explicit knowledge acquisition by employees through in-company training, which is considered as a transfer mechanism.

**Competence as a Component of Human Capital**

The competence perspective on individual level was investigated by (Boyatzis, 1982; North & Kumta, 2018; North, Reinhardt, & Sieber-Suter, 2018). In his book “The Competent Manager”, Boyatzis, argued that companies need competent managers in order to achieve their targets. North et al. elaborated on development of individual competencies within an organization and created a practical guideline how systematically to identify, to utilize and develop employees’ competencies. Table 3 demonstrates some selected definitions of competence which underlie the existing differences in their terminology.

**TABLE 3. Selected definitions of components**

| Source                  | Definition of competence                                                                 | Key Components                      |
|-------------------------|------------------------------------------------------------------------------------------|-------------------------------------|
| Boyatzis (1982)         | Boyatzis called the characteristics of an employee which contribute to their performance as competencies. | Employee characteristics           |
| Sydänmaanlakka (2002)  | "Competence consists of knowledge, skills, attitudes, experiences and contacts. Processes, ways of working and culture are included in organizational competence". | Behavior                             |
| Winterton (2007)        | "Competence embraces the ability"                                                        | Ability                              |
| North and Kumta (2018)  | "[...] relationship between the tasks assigned to or assumed by the person or the group and their capability and potential to deliver a desired performance. People mobilise knowledge, skills and behaviours to "do the right thing at the right moment"". | Knowledge, skills and behaviors      |

Those definitions imply that competencies are context-specific, embedded in person, contain aspects of human capital like knowledge, skills, behavior or attitudes and connected to performance. In addition, they depend on the activities for which they are used, and on the environment. North and Kumta indicated with their “The Knowledge Ladder” that competence is more than knowledge, because it is only existing in connection with knowledge as foundation.

**Employee Performance and how it is Defined**

“Performance is not one thing” Campbell (2012) and consequently, many authors proposed its definitions based on which determinants they used to describe the construct “performance”. Table 4 presents the selected definitions, which underlie different aspects of employee performance.

**TABLE 4. Selected definitions of performance**

| Source                  | Definition of performance                                                                 | Key Components                      |
|-------------------------|------------------------------------------------------------------------------------------|-------------------------------------|
| Murphy and Kroeker (1988) | "[...] set of behaviours that are relevant to the goals of the organization or the organizational unit in which a person works". | Behavior                             |
| Campbell (1999)         | "[...] behavior or action that is relevant for the organization’s goals and that can be scaled (measured) in terms of the level of proficiency (or contribution to goals) that is represented by a particular action or set of actions". | Behavior, action                     |
Among the theoretical models of job performance are models which explain the construct of job performance by deriving its dimensions, e.g. (Koopmans et al., 2011) and those identifying factors which explain variance in job performance (Schmidt & Hunter, 1998). Moreover, there are models which see performance as dynamic (Murphy, 1989) and those seeing performance stable over time (Campbell, 2012).

(Murphy & Kroeker, 1988) used a construct-oriented approach to develop a general framework describing the dimensions of job performance for Navy ranks. First, they specified the set of goals. Second, based on those goals, the authors defined the set of nine dimensions. Third, they determined two categories of input variables: fluid and fixed. Fluid variables defined as changeable over time (e.g. experience) and fixed variables are relatively stable (e.g. cognitive ability). In the last step, they linked defined input variables which represent relevant attitudes of an employee at work to the specific dimensions of the performance construct. One year later, (Murphy, 1989) published his work on a dynamic performance model, where he differentiated between transition and maintenance stages. In the model he considered only two types of variables: abilities and dispositional variables. The results showed that cognitive ability is highly crucial during transition stage, e.g. when learning new techniques. During maintenance stage cognitive ability is less relevant, but rather dispositional factors such as motivation, etc.

Campbell worked with other scientists on their performance model over years. The revised model version specified the latent construct, job performance, in terms of eight factors. As per the model, individual performance variances are a function of direct and indirect determinants. To the direct determinants count current job-related knowledge and skills, choice to perform, level of effort commitment and the persistence. Indirect determinants are all variables which lead to individual differences in direct determinants (e.g. training). The indirect determinants are able to influence performance only by influencing direct determinants (Campbell, 2012). (Motowildo, Borman, & Schmit, 1997) assumed that performance is episodic, multidimensional and behavioral. They distinguished between task and contextual performance. Task performance is related to technical core of an organization and contextual performance to its social, psychological and organizational environment. In addition, the model includes two basic tendencies, cognitive ability and personality. It implies that both cognitive ability and personality traits explain individual difference in task and contextual performance through intervening variables: knowledge, skills and habits.

Welbourne, Johnson, and Erez (1997) developed, based on role and identity theory, the Role-Based Performance Scale (RBPS) which included five different roles. The authors emphasized that the RBPS enables comparison between different jobs and organizations, because it focuses on multiples roles and it is generic and multidimensional.

Pulakos, Arad, Donovan, and Plamondon (2000) created in two steps a framework for determining the adaptive performance requirements of jobs. First, they used review and content analysis to identify dimensions of adaptive performance. Second, they used an instrument, the Job Adaptability Inventory (JAI) and applied exploratory and confirmatory factor analyses to test the eight dimensions of adaptive performance construct and to diagnose adaptive performance requirements for jobs. The result of their research showed that different jobs require different types of adaptive performance.

Schmidt and Hunter (1998) analyzed relationship between General Mental Ability (GMA), job knowledge, job performance, and supervisor ratings for civilian and military jobs. Their findings are that GMA has the strongest effect on job knowledge acquisition and higher level of job knowledge in turn lead to a higher job performance. GMA influences also job performance directly, but those effect not as strong as those via job knowledge acquisition. This result is consistent with their previous work, where they concluded that GMA has strong indirect effect on job performance through job knowledge (Schmidt & Hunter, 1998).

Koopmans et al. (2011) conducted a systematic review of 35 existing frameworks of individual work performance and identified four performance dimensions which were used frequently in different frameworks. Table 5 summarizes the various dimensions of job performance which were conceptualized by the six previously described studies.
25 years ago, (Campbell, McCloy, Oppler, & Sager, 1993) placed a comment about the primitiveness of job performance theories. Since then, a number of researches have worked on theories and models of the job performance construct. The reviewed models of job performance conceptualized and operationalized different dimension to explain the job performance construct. As well as input variables which were involved to understand the variances are differ from model to model, which impacts sustainability of concepts consequently. Will those models deliver the same results when tested again with different data samples? This is the question. Despite many research approaches, no unified approach has been elaborated and no clear consensus about which dimensions explain job performance construct has been achieved.

**METHODOLOGY**

This research is exploratory and interpretative in nature. It is based on conclusions from the analysis of the existing theoretical literature and empirical studies conducted from 1962 to 2018 and related to the variables “in-company training”, “knowledge”, “competence” and “employee performance in the workplace”. Essentially, it is not about the exhaustive recording of all investigations, but rather about their variables, methodology, results and research deficits. This research work will provide an understanding of the available theoretical basis on in-company training, knowledge, competence and performance. It will summarize what has been empirically proven on training effects so far. This, in turn, will signalize a direction to understand effects of in-company training and the territory still to be explained, especially on employee’s knowledge, competence and performance. The results will be used to develop a theoretical framework for future empirical research on the relationship between in-company training, knowledge, competence and performance of employees in the workplace.

**EMPIRICAL STUDIES**

The number of empirical publications on various training effects has been steadily increasing since the Human Capital Theory was shaped. The longest tradition is studies analyzing the impact of training on income, e.g. (Mincer, 1962). From 1990s, the number of studies analyzing the wage effects has taken a downswing. Instead, the studies analyzed the effects of training on employee and firm performance, productivity, fluctuation, behavior, knowledge, competence, attitude, etc. have appeared, e. g. (Kurtmollaiev, Pedersen, Fjuk, & Kvale, 2018). Also, geographically the picture has been changed. The first studies were conducted in US and West Europe, but within the last five years the number of studies from developing countries has been increased, e.g. (Suharno & Despinur, 2017).

65 empirical studies on training effects, thereof 45 from development countries, were analyzed. 52 of them used company data from databases or generated them from surveys and experiments. Another 10 of the analyzed studies used longitudinal data, in which respondents asked whether they participated in some form of training in a specific reference period and did not measure accumulated stock of training, e.g. (Loewensteins & Spletzer, 1999). Data sources of analyzed studies are summarized in Figure 1.

In 53 analyzed studies, training was defined as an independent variable. Depending on the study this denoted for formal and informal training, on-the-job, off-the-job training, etc. However, the exact definition of training was not always provided, e. g. (Anitha & Kumar, 2016). 10 studies defined independent variable as competence, knowledge, skills or mix of training and development measures, e. g.

### TABLE 5. Dimensions of performance

| Source                          | Dimensions of job performance                                                                 | Number of dimensions |
|--------------------------------|------------------------------------------------------------------------------------------------|----------------------|
| Motowildo et al. (1997)        | Task performance, contextual performance.                                                      | 2                    |
| Pulakos et al. (2000)           | Handling emergencies or crisis situations, handling work stress, solving problems creatively, dealing with uncertain and unpredictable work situations, learning work tasks, technologies, and procedures, demonstrating interpersonal adaptability, demonstrating cultural adaptability, and demonstrating physically oriented adaptability. | 8                    |
| Koopmans et al. (2011)          | Task performance, contextual performance, counterproductive work behaviour and adaptive performance. | 4                    |
| Welbourne et al. (1997)         | Job holder role behavior, organization member role behavior, career role behavior, innovator role behavior and team member role behavior. | 5                    |
| Campbell (2012)                | Job-specific technical task proficiency, non-job-specific technical task proficiency, written and oral communication task proficiency, demonstrating effort, maintaining personal discipline, facilitating peer and team performance, supervision or leadership, and management or administration. | 8                    |
| Murphy and Kroeker (1988)       | Effectiveness in position, individual task performance, team task performance, interpersonal relations, job proficiency, job-related skills, task-related knowledge, down time behaviors, destructive / hazardous behaviors. | 9                    |
Performance, productivity and income were the frequently used dependent variables. Those 3 variables were used in 60% of all studies, e.g. (Marin-Diaz, Llinas-Audet, Chiaramonte-Cipolla, & Escardibul, 2014). The number of empirical studies on measuring the relationship between training and knowledge is relatively modest, 7 studies were identified, e.g. (Neirotti & Paolucci, 2013). Effects on competence, capabilities and skills were measured only in 3 investigations, e.g. (McLinden, Davis, & Sheriff, 1993). In reviewing the literature on relationship between competence and performance, 3 studies were found, e.g. (Mangkunegara & Waris, 2015). Figure 2 and Figure 3 demonstrate the utilized independent and dependent variables in analyzed empirical investigations.

Overall, the studies regarding training effects deliver contradictory results. There are analyses that proved a positive correlation between in-company training and wages and others that did not find a significant correlation, e.g. (Russell, Terborg, & Powers, 1985). The studies on the estimation of productivity effects of in-company training also provide a contradictory picture. Among them are studies that could not prove that general training has an impact on employee productivity, e.g. (Barrett & O’Connell, 2001). Besides the contradictory results, the research studies also cannot be easily compared, since the variable “training” was not always defined precisely and uniformly and was measured by the surveys differently, e.g. continuous training, training in the workplace, formal training, e.g. (Chien, 2013). Similar situation is regarding the examination of the relationship between training and knowledge. The study by (Rowell, Binkley, Thompson, Burris, & Alvarado, 2013) investigated an impact of food safety training on employee knowledge of food safety practices. The outcome is that managers did not obtain any additional knowledge after the provided food safety certification training. In contrast, the study by (Neirotti & Paolucci, 2013) and by (Schmidt & Hunter, 1998) showed the positive relationship between specific training and knowledge acquisition of employees. Similar is the situation with studies measuring relationship between competence and performance. A positive relationship between competence and performance was reported by (Mangkunegara & Waris, 2015) and (Kolibáčová, 2015). However, the recent research by (Suharno & Despinur, 2017) did not measure any effect. Another research by (Yang, Fang, & Huang, 2017) demonstrated a mediating role of competencies between training and task performance and proved a significant effect of professional, technical, and core competencies on the link between training and task performance. The results on the effects on dependent variables within empirical studies summarized in Figure 4.
The review of empirical studies from different countries has shown that human capital and human capital analysis has been treated very differently by scientists. Various authors emphasize one or another aspect of human capital and its effects, considering their specific goals, methodology, challenges and contexts. The overview of 65 empirical studies with respective variables and effects is outlined in Appendix A.

CONCLUSION

The economic and management theories related to human capital, knowledge, competence and employee performance were reviewed. The investment in training was theorized within Human Capital Theory. It has not only theoretical, but also practical relevance for identifying the real value of training. However, the Human Capital Theory is behind the investment practice of companies and agendas of economic, social and political institutions on importance of lifelong learning. There is little empirical evidence available, often with contradictory results, on the question of the economic efficiency of the provision of in-company training. The statement from Mincer that “[…] “training” denotes investment in acquisition of skill or in improvement of worker productivity” (Mincer, 1962) is not always confirmed in empirical studies.

The theories on knowledge, competence and performance were developed after the Human Capital Theory. Nevertheless, they seem not to align on this theory or to continue to develop it further but rather to focus on independency. Although, some of the performance theories included training and knowledge as indicators in their models, but neglected competence or defined it by utilizing different terms.

Numerous empirical research studies have dealt with the explanation of training effects since the 60s of the mid 20th century. 65 empirical studies on various training effects were analyzed. The theoretical and methodological diversity of those empirical studies investigating relationships between training and other variables is very large indeed. The empirical investigations have measured the link between training and employee performance but not explored non-linear relationships and interdependencies between training and performance. There are a modest number of studies the depart from analyzing direct relationship and included mediating variables such as “competence”. What we have today is a puzzle of theories and empirical studies on effects of training. No empirical study which examined the relationship between in-company training and performance of employees by using the mediating variables knowledge and competence could be found thus far.

“There is need for more work in measuring the return to training” (Acemoglu & Pischke, 1998; Mincer, 1962). “Empirical evidence on the economic impact of employer investment in training is only just emerging” (Asplund, 2004). “Our knowledge of training benefits is also limited” (Bassanini, Booth, Brunello, De Paola, & Leuven, 2005). The statements were made more than 10 years ago, because the most studies on training effects looked at the wage returns. Nevertheless, some of the scientists were aware of the limitations in their research and saw a lot of opportunities for further research. For example, Schultz concluded “But the state of the economic efficiency and that of the equity associated with the various forms of postschool investment are still among unknowns” (Schultz, 1972).

Before any conclusion regarding training effects on knowledge, competence and performance can be drawn, the following question for future research is proposed: “How does in-company training interact with knowledge, competence and performance”? or “What is the role of knowledge and competence in the relationship between in-company training and employee performance”? Another question from broader perspective could be: “How does general in-company training interact with three performance modes: individual, organizational and economical”?

“[…] what individuals have learned by age twenty-one will begin to become obsolete five to ten years later and will have to be replaced - or at least refurbished - by new learning, new skills, new knowledge” (Drucker, 1985). On the one hand, organizations follow the advice of Drucker and in-company training has taken an impressive upswing, on the other hand, the performance effects of in-company training and the role of mediating variables have only been partially explored in science. This is the driving force behind future research to investigate the effects of general in-company training on knowledge, competence and performance in the workplace. The resulting findings will have not only academic relevance but a significant practical relevance to design results-oriented learning strategies at companies.

REFERENCES

Acemoglu, D., & Pischke, J.-S. (1998). Why do firms train? theory and evidence. The Quarterly Journal of Economics, 113(1), 79-119. doi:https://doi.org/10.1162/003355398555531
Afroz, N. N. (2018). Effects of training on employee performance - a study on banking sector, tangail bangladesh. *Global Journal of Economics and Business, 4*(1), 111–124. doi:https://doi.org/10.12816/0048158

Al-Mzary, M. M. M., & Hani, A.-r. A. D. A. n. A.-M. M. O. E., M. (2015). Training and its impact on the performance of employees at jordanian universities from the perspective of employees: The case of yarmouk university. *Journal of Education and Practice, 6*(32), 128–140. doi:https://doi.org/10.19030/jep.v6i32.3740

Anitha, R., & Kumar, M. A. (2016). A study on the impact of training on employee performance in private insurance sector, coimbatore district. *International Journal of Management Research and Reviews, 6*(8), 1079-1100. doi:https://doi.org/10.2139/ssrn.3316856

Asplund, R. (2004). *The provision and effects of company training: A brief review of the literature* (Discussion paper,). The Research Institute of the Finnish Economy (ETLA), Helsinki, Finland.

Barling, J., Weber, T., & Kelloway, E. K. (1996). Effects of transformational leadership training on attitudinal and financial outcomes: A field experiment. *Journal of Applied Psychology, 81*(6), 827-835. doi:https://doi.org/10.1037/0021-9010.81.6.827

Barrett, A., & O’Connell, P. J. (2001). Does training generally work? the returns to in-company training. *ILR Review, 54*(3), 647-662. doi:https://doi.org/10.2307/2695995

Barret, A. P. (1989). *Formal employee training programs and their impact on labor productivity: Evidence from a human resources survey* (Working paper No. 302). National Bureau of Economic Research, New York, NY.

Bassanini, A., Booth, A., Brunello, G., De Paola, M., & Leuven, E. (2005). *Workplace training in europe* (Discussion paper No No. 1640). Institute for the Study of Labor (IZA), Bonn, Germany.

Becker, G. S. (1993). *Nobel lecture: The economic way of looking at behavior.* Chicago, IL: The University of Chicago Press.

Bell, J. L., & Grushecky, S. T. (2006). Evaluating the effectiveness of a logger safety training program. *Journal of Safety Research, 37*(1), 53-61. doi:https://doi.org/10.1016/j.jsr.2005.10.019

Bhalerao, S. (2016). Role of emotional intelligence in organizational conflict management. *International Journal of Business and Administrative Studies, 2*(2), 37-43. doi:https://doi.org/10.20469/ijbas.2.10003-2

BHP. (2017). *Sustainability report 2017.* Retrieved from https://bit.ly/2B8K1sx (accessed on 15 June, 2018)

Birdi, K., Leach, D. J., & Magadley, W. (2012). Evaluating the impact of TRIZ creativity training: An organizational field study. *R&D Management, 42*(4), 315–326. doi:https://doi.org/10.1111/j.1467-9310.2012.00686.x

Black, S. E., & Lynch, L. M. (1996). Human-capital investments and productivity. *The American Economic Review, 86*(2), 263-267.

Boyatzis, R. E. (1982). *The competent manager: A model for effective performance.* New York, NY: John Wiley & Sons.

Campbell, J. P. (1999). The definition and measurement of performance in the new age. In D. R. Ilgen, & E. D. Pulakos (Eds.), *The changing nature of performance: Implications for staffing, motivation, and development.* San Francisco, CA: Jossey-Bass.

Campbell, J. P. (2012). *Behavior, performance, and effectiveness in the twenty-first century. in s. w. j. kozlowski (ed.), the oxford handbook of organizational psychology.* Oxford, UK: Oxford University Press.

Campbell, J. P., McCloy, R. A., Oppler, S. H., & Sager, C. E. (1993). *A theory of performance. in n. schmitt, w. c. borman and associates (eds.), personnel selection in organizations.* San Francisco, CA: Jossey-Bass Publishers.

Campbell, J. P., & Wiernik, B. M. (2015). The modeling and assessment of work performance. *Annual Review of Organizational Psychology and Organizational Behavior, 2*(1), 47-74. doi:https://doi.org/10.1146/annurev-orgpsych-032414-111427

Cascio, W. F., & Aguinis, H. (2011). *Applied psychology in human resource management.* New Jersey, NJ: Pearson Education, Inc.

Chauvin, C., Clostermann, J. P., & Hoc, J. M. (2009). Impact of training programs on decision-making and situation awareness of trainee watch officers. *Safety Science, 47*(9), 1222–1231.

Chien, Y.-C. (2013). The effects of organizational performance on the intellectual capital accumulation of taiwan-listed biotechnology companies: Organizational citizen behavior as a moderator. *The Journal of Human Resource and Adult Learning, 9*(1), 40-50.
Chong, C. Y., & Lee, T. S. (2017). Employee retention and job performance attributes in private institutions of higher education. *International Journal of Business and Administrative Studies, 3*(5), 158-165. doi:https://doi.org/10.20469/ijbas.3.10001-5

Cooney, R., Terziovski, M., & Samson, D. (2002). Employee training, quality management and the performance of Australian and New Zealand manufacturers (Working paper No. 34/02). Faculty of Business and Economics, Monash University, Melbourne, Australia.

Davenport, T. H., Prusak, L., et al. (1998). *Working knowledge: How organizations manage what they know*. Cambridge, MA: Harvard Business Press.

Dearden, L., Machin, S., Reed, H., & Wilkinson, D. (1997). *Labour turnover and work-related training* (No. R53). New York, NY: IFS Reports, Institute for Fiscal Studies.

Dearden, L., Reed, H., & Reenen, J. V. (2005). The impact of training on productivity and wages: Evidence from British panel data (Discussion Paper No. 674). Centre for Economic Performance, New York, NY.

Dearden, L., Van Reenen, J., & Reed, H. (2000). Who gains when workers train? Training and corporate productivity in a panel of British industries (Working paper No. W00/04). Institute for Fiscal Studies (IFS), London, UK.

De Kok, J. (2002). The impact of firm-provided training on production: testing for firm-size effects. *International Small Business Journal, 20*(3), 271-295. doi:https://doi.org/10.11177/0266242602203003

Demiral, O. (2017). Effects of training on employee job satisfaction and achievement: ‘train to gain’ evidence from manufacturing businesses in Turkey. *Business & Management Studies: An International Journal, 5*(3), 765-785. doi:https://doi.org/10.15295/bmij.v5i3.157

Der Vleuten, V. (2000). Effect of a short skills training course on competence and performance in general practice. *Medical Education, 34*(1), 66-71. doi:https://doi.org/10.1046/j.1365-2923.2000.00401.x

Dostie, B., & Léger, P. T. (2014). Firm-sponsored classroom training: Is it worth it for older workers? *Canadian Public Policy / Analyse de Politiques, 40*(4), 377-390. doi:https://doi.org/10.3138/cpp.2013-071

Drucker, P. F. (1985). *Innovation and entrepreneurship: Practice and principles*. New York, NY: Harper and Row.

Drucker, P. F. (1999). *Management challenges for the 21st century*. New York, NY: Harper Business

Drucker, P. F., & Maciariello, J. A. (2008). *Management cases, revised edition*. New York, NY: Harper Business.

European Commission. (2013). *Education and training in Europe 2020: Responses from the EU member states*. Retrieved from https://bit.ly/2GdlruT (accessed on 14 July, 2018)

Fu, F. Q., Yi, H., & Zhai, N. (2013). Training to improve new product sales performance: The case of samsung in China. *Performance Improvement, 52*(5), 28-35. doi:https://doi.org/10.1002/pfi.21346

Gallup. (2014). *The 2013 Lumina Study of the American public’s opinion on higher education and U.S. business leaders poll on higher education: What America needs to know about higher education redesign*. Retrieved from https://bit.ly/2Gp5otn (accessed on 13 June, 2018)

Garcia, M. U. (2005). Training and business performance: The Spanish case. *The International Journal of Human Resource Management, 16*(9), 1691-1710. doi:https://doi.org/10.1080/09585190500239341

Gazprom. (2017). *PJSC Gazprom annual report 2017*. Retrieved from https://bit.ly/2t6oBbg (accessed on 14 June, 2018)

Greenhalgh, C., & Stewart, M. (1987). The effects and determinants of training. *Oxford Bulletin of Economics and Statistics, 49*(2), 171-190. doi:https://doi.org/10.1111/j.1468-0084.1987.mp4902001.x

Groh, K.-N. M. D. V. T., M. (2016). The impact of soft skills training on female youth employment: Evidence from a randomized experiment in Jordan. *Journal of Labor & Development, 5*(1), 1-23. doi:https://doi.org/10.1186/s40175-016-0055-9

Guerrazzi, M. (2016). The effect of training on Italian firms’ productivity: Microeconomic and macroeconomic perspectives. *International Journal of Training and Development, 20*(1), 38-57. doi:https://doi.org/10.1111/ijtd.12068

Hand, H. H., & Slocum, J. W. (1972). A longitudinal study of the effects of a human relations training program on managerial effectiveness. *Journal of Applied Psychology, 56*(5), 412-420. doi:https://doi.org/10.1037/h0033592

Hayek, F. A. (1945). The use of knowledge in society. *The American Economic Review, 35*(4), 519-530. doi:https://doi.org/10.1017/cho9780511817410.007

Hinerasky, C., & Fahr, R. (2011). When the early bird catches the worm: The impact of training in retail (Discussion paper No. 6037). Institute for the Study of Labor, Berlin, Germany.
Holoviak, S. J. (1982). The impact of training on company productivity levels. *Performance & Instruction, 21*(5), 6-8. doi: https://doi.org/10.1002/phi.4170210505

Huang, J. (2015). Knowledge is prudence: How entrepreneurs benefit from business training in a field experiment. *Academy of Management Proceedings, 20*(5), 24-50. doi:https://doi.org/10.5465/ampp.2015.12034

Jones, B. (2008). *The knowledge trap: Human capital and development reconsidered* (Working Paper No. 14138). National Bureau of Economic Research, New York, NY.

Jones, P. (2001). Are educated workers really more productive? *Journal of Development Economics, 64*(1), 57-79. doi: https://doi.org/10.1016/S0304-3878(00)00124-3

Karim, M. H., Elyas, K. M., Mahmood, S. N., & Hossein, A. (2017). Evaluation of human resources re-engineering and knowledge management processes on the economy of Sirjan free trade zone (Iran). *International Journal of Business and Economic Affairs, 2*(2), 127-134. doi:https://doi.org/10.24088/ijbea-2017-22006

Khan, R. A. G., Khan, F. A., & Khan, D. M. A. (2011). Impact of training and development on organizational performance. *Global Journal of Management and Business Research, 11*(17), 63-68.

Kolibáčová, G. (2015). The relationship between competency and performance. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 62*(6), 1315-1327. doi: https://doi.org/10.11118/actaun201462061315

Konings, J., & Vanormelingen, S. (2010). *The impact of training on productivity and wages: Firm level evidence* (Discussion paper No. 4731). Institute for the Study of Labor, Berlin, Germany.

Koopmans, L., Bernaards, C. M., Hildebrandt, V. H., Schaufeli, W. B., de Vet, Henrica, C., & van der Beek, A. J. (2011). Conceptual frameworks of individual work performance: A systematic review. *Journal of Occupational and Environmental Medicine, 53*(8), 856-866. doi: https://doi.org/10.1097/jom.0b1013e3182262a763

Krueger, A., & Rouse, C. (1998). The effect of workplace education on earnings, turnover, and job performance. *Journal of Labor Economics, 16*(1), 61-94. doi: https://doi.org/10.1086/209882

Kuckulenz, A. (2006). *Wage and productivity effect of continuing training in Germany: A sectoral analysis* (Discussion paper No. 06-025). Zentrum Fur Europäische Wirtschaftsforschung (ZEW), Mannheim, Germany.

Kurniawati, E. P., & Meiliana Intani, A. (2016). Effect analysis of the use of accounting information, managerial performance and employee performance towards SMEs. *Journal of Administrative and Business Studies, 2*(3), 130-142. doi:https://doi.org/10.20474/jabs-2.3.4

Kurtmollaiev, S., Pedersen, P. E., Fjuk, A., & Kvale, K. (2018). Developing managerial dynamic capabilities: A quasi-experimental field study of the effects of design thinking training. *Academy of Management Learning & Education, 17*(2), 184-202. doi: https://doi.org/10.5465/amle.2016.0187

Liu, X., & Batt, R. (2005). *The economic pay-offs to on-the-job training in routine service work* (Working paper No. 05-11). Center for Advanced Human Resource Studies, Cornell University, Ithaca, NY.

Loewenstein, M. A., & Spletzer, J. R. (1999). General and specific training: Evidence and implications. *Journal of Human Resources, 34*(4), 710-733. doi: https://doi.org/10.1230/jhr.1999.4.4.710

Lowe, K., Jones, E., Allen, D., Davies, D., James, W., Doyle, T., ... others (2007). Staff training in positive behaviour support: Impact on attitudes and knowledge. *Journal of Applied Research in Intellectual Disabilities, 20*(1), 30-40. doi: https://doi.org/10.1111/j.1468-3148.2006.00337.x

Magableh, I. K., Khabasheh, R., & al-Zubi, K. A. (2011). Determinants and impact of training: The case of SMEs in Jordan. *International Journal of Economics and Finance, 3*(5), 104–116. doi:https://doi.org/10.5539/ijef.v3n5p104

Mangkunegara, A. P., & Waris, A. (2015). Effect of training, competence and discipline on employee performance in company (case study in pt. asuransi bangun askrida). *Procedia-Social and Behavioral Sciences, 211*(6), 1240-1251. doi:https://doi.org/10.1016/j.sbspro.2015.11.165

Marin-Díaz, M. L., Llinas-Audet, X., Chiaramonte-Cipolla, L., & Escardibul, J.-O. (2014). The effects of training on the competitive economic advantage of companies in Spain. *Education Research International, 14*(5), 1-9. doi: https://doi.org/10.1155/2014/749606

McLinden, D. J., Davis, M. J., & Sheriff, D. E. (1993). Impact on financial productivity: A study of training effects on consulting services. *Human Resource Development Quarterly, 4*(4), 367-375. doi:https://doi.org/10.1002/hrdq.3920040407

Mensmann, M., Frese, M., Campos, F., Goldstein, M., Iacovone, L., Johnson, H., & McKenzie, D. (2018). Closing the gender gap – personal initiative training and female business performance. *Academy of Management Proceedings, 20*(1), 45-67.
Mincer, J. (1962). On-the-job training: Costs, returns, and some implications. *Journal of Political Economy, 70*(2), 50-79. doi:https://doi.org/10.1086/258725

Mincer, J. (1975). Education, experience, and the distribution of earnings and employment: An overview. In F. T. Juster (Ed.), *Education, income, and human behavior*. New York, NY: National Bureau of Economic Research.

Motowildo, S. J., Borman, W. C., & Schmit, M. J. (1997). A theory of individual differences in task and contextual performance. *Human Performance, 10*(2), 71-83. doi:https://doi.org/10.1207/s15327043hup1002_1

Murphy, K. R. (1989). Is the relationship between cognitive ability and job performance stable over time? *Human Performance, 2*(3), 183-200. doi:https://doi.org/10.1207/s15327043hup0203_3

Murphy, K. R., & Kroeker, L. P. (1988). *Dimensions of job performance* (Working paper No. 88-39). Navy Personnel Research and Development Center, San Diego, CA.

Neirotti, P., & Paolucci, E. (2013). Why do firms train? empirical evidence on the relationship between training and technological and organizational change. *International Journal of Training and Development, 17*(2), 93-115. doi:https://doi.org/10.1111/ijtd.12003

Noe, R. A., Hollenbeck, J. R., Gerhart, B., & Wright, P. M. (2007). *Fundamentals of human resource management*. Boston, MA: McGraw-Hill/Irwin.

Odhong, E. A., & Omolo, J. (2015). Effect of human capital investment on organizational performance of pharmaceutical companies in kenya. *Global Journal of Human Resource Management, 3*(6), 1-29.

Ozyurek, H., & Uluturk, Y. (2016). Flexible budgeting under time-driven activity based cost as a tool in management accounting: Application in educational institution. *Journal of Administrative and Business Studies, 2*(2), 64-70. doi:https://doi.org/10.20474/jabs-2.2.2

Russell, J. S., Terborg, J. R., & Powers, M. L. (1985). Organizational performance and organizational level training and support. *Personnel Psychology, 38*(4), 849-863. doi:https://doi.org/10.1111/j.1744-6570.1985.tb00570.x

Sanyal, S., & Hisam, M. W. (2018). Impact of training and development on employee performance: A comparative study on select banks in sultanate of oman. *Research Journal of Finance and Accounting, 9*(6), 53–58. doi:https://doi.org/10.18535/ijsrm/v6i3.em02

Schneider, R. J., & Colan, N. B. (1992). The effectiveness of employee assistance program supervisor training: An experimental study. *Human Resource Development Quarterly, 3*(4), 345-356.
Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1-17. doi:https://doi.org/10.2307/2525048

Schultz, T. W. (1972). Human capital: Policy issues and research opportunities. In T. W. Schultz (Ed.), *Economic research: Retrospect and prospect*. New York, NY: National Bureau of Economic Research.

Schumpeter, J. A. (1991). *Essays on entrepreneurs, innovations, business cycles, and the evolution of capitalism*. New Brunswick, UK: Transaction Publishers.

Sembiring, R. (2016). Impact of human resources’ knowledge and skills on smes’ in medan city, indonesia. *International Journal of Management, Economics and Social Sciences, 5*(3), 95–104.

Sendawula, K., Kimuli, S. N., Bananuka, J., & Muganga, G. N. (2018). Training, employee engagement and employee performance: Evidence from uganda’s health sector. *Cogent Business & Management, 5*(1), 1–12. doi:https://doi.org/10.1080/23311975.2018.1470891

Siemens, A. G. (2018). *Siemens dual vocational education and training in figures*. Retrieved from https://sie.ag/2R5WySA (accessed on 25 October, 2018)

Statista. (2018). *Market size of the global workplace training industry from 2007 to 2017*. Retrieved from https://bit.ly/2Nt4Vdr (accessed on 29 April, 2018)

Suharno, P., & Despinur, D. (2017). The impact of work motivation and competence on employee performance through service quality in administrative staff of universitas negeri jakarta, indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences, 61*(1), 45-50.

Sultana, A., Irum, S., Ahmed, K., & Mehmood, N. (2012). Impact of training on employee performance: A study of telecommunication sector in pakistan. *Interdisciplinary Journal of Contemporary Research in Business, 4*(6), 646–661. doi:https://doi.org/10.15373/2249555x/june2013/97

Sunardi, O., Widyarini, M., & Tjakraatmadja, J. H. (2012). The impact of sales forces training program to employees behaviour styles (a quasi-experimental case study in a medium sized enterprise). *Procedia Economics and Finance, 4*(5), 264–273. doi:https://doi.org/10.1016/s2212-5671(12)00341-3

Sung, S. Y., & Choi, J. N. (2014). Do organizations spend wisely on employees? effects of training and development investments on learning and innovation in organizations. *Journal of Organizational Behavior, 35*(3), 393–412. doi:https://doi.org/10.1002/job.1897

Sydänmaanlakka, P. (2002). *An intelligent organization: Integrating performance, competence and knowledge management*. London, UK: Capstone.

Tetteh, S., Sheng, W. C., Yong, L. D., Narh, O. C., & Sackitey, O. E. (2017). The impact of training and development on employee performance: A case study of millicom Ghana limited - tigo. *International Journal of Information Research and Review, 4*(1), 3482–3487. doi:https://doi.org/10.21522/tijar.2014.05.01.art005

Towler, A. J. (2003). Effects of charismatic influence training on attitudes, behavior, and performance. *Personnel Psychology, 56*(2), 363-381. doi:https://doi.org/10.1111/j.1744-6570.2003.tb00154.x

United Nations Educational, Scientific and Cultural Organization. (2017). *Education for sustainable development goals: Learning objectives*. Retrieved from https://bit.ly/2M0wpaX (accessed on 16 July, 2018)

Welbourne, T. M., Johnson, D. E., & Erez, A. (1997). *The role-based performance scale: Validity analysis of a theory-based measure* (Working paper No. 97-105). Center for Advanced Human Resource Studies, Cornell University, School of Industrial and Labor Relations, Ithaca, NY.

Winterton, J. (2007). Training, development, and competence. In P. Boxall, J. Purcell, P. M. Wright (Eds.), *The Oxford handbook of human resource management*. Oxford, UK: Oxford University Press.

World Economic Forum. (2016). *The future of jobs. employment, skills and workforce strategy for the fourth industrial revolution (global challenge insight report)*. Retrieved from https://bit.ly/2PjT15 (accessed on 14 July, 2018)

Yang, J.-H., Fang, S.-C., & Huang, C.-Y. (2017). The mediating role of competency on the relationship between training and task performance: Applied study in pharmacists. *International Journal of Business Administration, 8*(7), 16-19. doi:https://doi.org/10.5430/ijba.v8n7p16

Zweimuller, J., & Winter-Ebmer, R. (2000). *Firm-specific training: Consequences for job mobility* (Working paper No. 37). Institute for Empirical Research in Economics University of Zurich, Zurich, Switzerland.
Zwick, T. (2002). *Continuous training and firm productivity in Germany* (Discussion paper No. 02-50). Zentrum Fur Europäische Wirtschaftsforschung (ZEW), Mannheim, Germany.

### APPENDIX

#### TABLE 6. Analyzed empirical studies on training effects from 1962 till 2018

| Authors | Independent Variable | Dependent Variable 1 | Dependent Variable 2 | Effect on Dependent Variable 1 | Effect on Dependent Variable 2 |
|---------|----------------------|----------------------|----------------------|---------------------------------|---------------------------------|
| Mincer (1962) | On-the-job training | Income | Employment behavior | No evidence | No evidence |
| Hand and Slocum (1972) | Managerial human relations training | Knowledge | Attitude, behavior | No effect | No effect |
| Holoviak (1982) | Company-sponsored training | Company productivity level | Performance occupational status of women | No effect | + |
| Russell et al. (1985) | Retal sales training | Organizational support | Occupational status of men | + | + |
| Greenhalgh and Stewart (1987) | Vocational training | Occupational status of women | Productivity | + | |
| Bartel (1989) | Formal training | Labor | Supervisor specific knowledge | + | + |
| Schneider and Colan (1992) | Supervisor specific training | Supervisor specific knowledge | Performance | No effect | |
| McLinden et al. (1993) | Training | Competence in tax area | Performance | No effect | |
| Bartel (1995) | On-the-job training | Wage growth | Job performance productivity in non-production companies | No effect | + |
| Black and Lynch (1996) | Formal off-the-job training | Productivity in production companies | Financial outcomes | No effect | + |
| Barling, Weber, and Kelloway (1996) | Transformational leadership training | Attitudinal outcomes (e.g. charisma) | Financial outcomes | No effect | + |
| Dearden, Machin, Reed, and Wilkinson (1997) | Employer-provided training | Job mobility | Financial outcomes | No effect | + |
| Krueger and Rouse (1998) | Training participation | Turnover | No effect | |
| a. Barrett and O’Connell (2001) | General training productivity growth | No effect | + |
| b. Barrett and O’Connell (2001) | Specific training productivity growth | No effect | + |
| Dearden, Van Reenen, and Reed (2000) | Private sector training | Productivity | + |
| Zweimuller and Winter-Ebmer (2000) | Firm-specific training | Employee turnover | No effect | |
| Der Vleuten (2000) | Training | Knowledge test | + |
| P. Jones (2001) | Firm-provided training | Productivity | + |
| De Kok (2002) | Firm-provided training | Production | - |
| Cooney, Terziowski, and Samson (2002) | Training | Employee moral | Company effectiveness | No effect | + |
| a. Zwick (2002) | On-the-job training | Firm productivity | No effect | |
| b. Zwick (2002) | External training | Firm productivity | + |
| Towler (2003) | Charismatic influence training | Charismatic behaviors performance | + | + |
| Liu and Batt (2005) | On-the-job training | Employee productivity | No effect | |
| Dearden, Reed, and Reenen (2005) | Training | Employee productivity | No effect | |
| Garcia (2005) | Training policies | Business performance | No effect | |
| Bell and Grushecky (2006) | Safety training | Effectiveness in reducing injuries | No effect | |

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| Authors                          | Independent Variable | Dependent Variable 1 | Dependent Variable 2 | Effect on Dependent Variable 1 | Effect on Dependent Variable 2 |
|---------------------------------|----------------------|----------------------|----------------------|---------------------------------|---------------------------------|
| Lowe et al. (2007)              | Training             | Knowledge            | Attitude             | +                               | +                               |
| Kuckulenz (2006)                | Training             | Wage                 | Productivity         | +                               | +                               |
| B. Jones (2008)                 | Training             | Job satisfaction     | Workplace performance | +                               | No evidence                     |
| Chauvin, Clostermann, and Hoc (2009) | Decision-making training | Capability          | Performance          | +                               | No effect                       |
| Konings and Vanormelingen (2010) | Firm training        | Productivity         | Wage                 | +                               | +                               |
| Hinerasky and Fahr (2011)       | E-Learning training  | Performance          |                      | No effect                       |                                 |
| Pfeifer, Janssen, Yang, and Backes-Gellner (2011) | Employer-provided formal training | Employee suggestions | Promotions            | Short term +                   | +                               |
| Khan, Khan, and Khan (2011)     | Training and development | Organizational performance |                      | +                               |                                 |
| Magableh, Kharabsheh, and Al-Zubi (2011) | Training | Firm performance      |                      | +                               |                                 |
| B. Jones (2008)                 | Training (general & firm-specific) | Wages                | Organizational performance | +                               | No effect                       |
| Sultana, Irum, Ahmed, and Mehmood (2012) | Employer-provided training | Employee performance | Employee performance | +                               |                                 |
| Sunardi, Widyarini, and Tjakraatmadja (2012) | Training | Employee behavior     |                      | +                               |                                 |
| Birdi, Leach, and Magadle (2012) | Creativity training  | Creative problem-solving skills | Motivation to innovate | Short term +                   | Short term +                    |
| Neirotti and Paolucci (2013)    | Training             | Acquisition of new knowledge | Organizational learning | +                               | No effect                       |
| Percival, Cozzarin, and Formaneck (2013) | Training Productivity | Productivity         |                      | Partially +                     |                                 |
| Fu, Yi, and Zhai (2013)         | Training             | Behavior             | Sales                | performance                      | +                               |
| Chien (2013)                    | Intellectual capital accumulation | Organizational performance |                      | +                               |                                 |
| Rowell et al. (2013)            | Food safety training | Knowledge of food safety practices |                      | No effect                       |                                 |
| Sung and Choi (2014)            | Training and development | Organizational innovation |                      | +                               |                                 |
| Marin-Diaz et al. (2014)        | Training             | Financial turnover   |                      | +                               |                                 |
| Dostie and Léger (2014)         | Firm-sponsored training | Production          | Wage                 | Falling +                       | Falling +                       |
| Kolháčová (2015)               | Employee competencies | Employee performance |                      | +                               |                                 |
| Huang (2015)                    | Business training    | Financial performance |                      | +                               |                                 |
| Al-Mzary and Hani (2015)        | Training             | Employee performance |                      | +                               |                                 |
| Mangkunegara and Waris (2015)   | Training, competence, etc., | Employee performance |                      | +                               |                                 |
| Odhong and Omolo (2015)         | Training, skills development, etc. | Organizational performance |                      | +                               |                                 |
Table 6. Continue.

| Authors                                              | Independent Variable           | Dependent Variable 1       | Dependent Variable 2       | Effect on Dependent Variable 1 | Effect on Dependent Variable 2 |
|-------------------------------------------------------|--------------------------------|---------------------------|---------------------------|--------------------------------|--------------------------------|
| Sembiring (2016)                                      | Knowledge and skills           | Firm performance          |                           | +                               |                                |
| Guerrazzi (2016)                                      | Employer-sponsored training    | Firm productivity         |                           | +                               |                                |
| Anitha and Kumar (2016)                               | Training                       | Employee productivity     |                           | +                               |                                |
| Groh (2016)                                           | Soft skills training           | Employment outcomes of young women |                       | No effect                      |                                |
| Tetteh, Sheng, Yong, Narh, and Sackitey (2017)         | Training and development       | Employee performance      |                           | +                               |                                |
| Demiral (2017)                                        | Training                       | Job satisfaction and achievement |                      | +                               |                                |
| Suharno and Despinur (2017)                           | Employee competence            | Work performance          |                           | No effect                      |                                |
| Yang et al. (2017)                                    | Training                       | Task performance          |                           | +                               |                                |
| Afroz (2018)                                          | Training, motivation, etc.     | Employee performance      |                           | +                               |                                |
| Sendawula, Kimuli, Bananuka, and Muganga (2018)        | Training                       | Employee performance      |                           | +                               |                                |
| Kurtmollaiev et al. (2018)                            | Design thinking training       | Sensing and seizing capabilities | Operational capabilities | +                               | -                              |
| Mensmann et al. (2018)                                | Personal initiative training   | Female business success   |                           | +                               |                                |
| Sanyal and Hisam (2018)                               | Training and development       | Employee performance      |                           | +                               |                                |