How can an understanding of learning theories be used in the design of training? A critical evaluation

Marius Sebastian Rücker

ABSTRACT

Due to an increase in technological complexity, corporations have realised the value of developing employees through corporate training. One aspect that defines how efficient and effective corporations can conduct training is the employee's capacity to learn. Therefore, this research paper examines the link between corporate training and organisational learning by evaluating learning theories from the paradigm areas behaviourism, cognitivism, and constructivism in regards to their utilization in terms of training design. This evaluation has led to the conclusion that an understanding of learning theories in the design of training is essential and even valuable in different stages of training.

1   INTRODUCTION

The development from the scientific management approach by Taylor towards the human relations approach was accompanied by an increasing attempt to humanise the workplace (Fairfield, 1974). The focus of companies started to change from perceiving employees as economic beings who are solely motivated by financial incentives and who are supposed to do simple manual tasks without further learning of new skills and qualifications, into a conception of employees as human beings who are intrinsically motivated and willing to learn. This transition was enabled by the realization that human beings are constantly involved in learning, which was then applied by organisations in forming learning and developing departments, as an advancement of human resources departments (Horton & Turnage, 1976). This demonstrates that the new insights from constant technology and skill changes were implemented in organisations for designing training and development concepts. The transition from manufacturing to service work also led on to an increased significance of the topic of learning. Furthermore, a shift in the values and aspirations of the employees, which regards personal growth as more important than a secure workplace for life, is responsible for an enhanced focus on learning in correspondence with training in organisations. This development encouraged the concept of lifelong learning, which forced organisations to address training that includes learning theories (Coffield, 2006).

To trace back the history of learning proves to be critical, because the majority of human activities can be seen in a concept of learning results. When examining the origin of experimental psychology, an interest in learning can be associated with philosophers, such as Descartes and Kant, which led to an increased recognition of learning in the early twentieth century (Horton & Turnage, 1976). Since then, different learning theories emerged, which resulted in various conceptual frameworks (Guey, Cheng, & Shibata, 2010). Certain conceptual frameworks are classified into different paradigms, such as behaviourism, cognitivism and constructivism, which are considered in this article. These particular learning theories were chosen because they are considered the three dominant learning theories (Nagowah & Nagowah, 2009). In addition to that, these three learning theories combine the criteria of practicability, validity and reliability with practical relevance (Ertmer & Newby, 2013).

This research paper is concerned with the question how an understanding of learning theories can be useful in the design of training. The focus hereby lies on training design in an organisational context. Therefore, different

CONTACT INFORMATION:
Marius Sebastian Rücker / Global Writing Solutions Ltd. / Bangkok / Thailand / sebastian@thecopymarketer.com

learning theories and their effectiveness in the context of training are analysed. After defining the major terms, significant learning theories from the paradigm areas behaviourism, cognitivism and constructivism are examined. Although numerous learning theories exist, this research paper focuses on two theories from each of the aforementioned three paradigms. In terms of the Behaviourist learning theories, classical and operant conditioning and Bandura's social learning theory are examined. Classical and operant conditioning are seen as the founding theory of all learning theories. Bandura's social learning theory is regarded as the bridge between behaviourist and cognitive learning theories (Mischel, 1973). Due to the fact that Baddeley's model of working memory and Piaget's theory of cognitive development can be seen as complementary models that build up on each other, these two cognitive learning theories were examined (Pascual-Leone, 2000). Regarding constructivist learning theories, the theory of problem based learning and Vygotsky's social development theory are examined. Due to their combinability in practical learning environments, these two theories were chosen (Harland, 2003). Therefore, it was decided to examine this theory before examining the cognitive learning theories. Thereby, the particular learning theories are discussed and the utilization in terms of training design is examined. Moreover, practical examples of how the learning theory could be implemented are given and a critical evaluation of the learning paradigm in the context of training design is conducted.

2   LEARNING AND TRAINING

In order to analyse the usage of learning theories in training design, a definition of learning and training is crucial. According to Buckley and Caple (2007), learning can be defined as a procedure of gaining skillsets, acquiring knowledge and attitudinal changes. This is caused through instructing, experiencing or assigning (Buckley & Caple, 2007). Learning can also be defined in terms of a behavioural change that is caused by practising and experiencing (Bass & Vaughan, 1966). A consistent aspect of learning definitions is the emphasis on experience, which is often set in the context of memory and remembering certain skills, knowledge and abilities (Hilgard & Bower, 1975). Training, on the other hand, can be defined as the acquisition of skillsets that are more related to the job than to the person (Reid, Barrington, & Kenney, 1992). In comparison to the aforementioned mechanical definition, Buckley and Caple (2007) define training according to the individual. Training is defined as a methodological effort and development that is determined in learning and experience, which enables an individual the acquisition of abilities (Buckley & Caple, 2007).

3   TRAINING DESIGN

A definition of training is crucial. Nevertheless, it is of utmost importance, that the design element that is discussed in the subsequent paragraphs is also fully understood. Therefore, a definition of training design is provided. Training design can be defined as a strategic outline of a practical concept that results in a performance improvement among the participants (Riding & Sadler-Smith). Thereby, it is important that training needs and expected outcomes are clearly defined, measured, and analysed. Specific training activities must be applicable to the purpose of the individual, the organization, or the audience segment (Baldwin & Ford, 1988).

4   BEHAVIOURIST LEARNING THEORIES IN THE DESIGN OF TRAINING

First of all, behaviourist theories, such as classical and operant conditioning and Bandura's social learning theory are examined. Classical conditioning can be defined as a progression of events where an unconditioned stimulus follows a conditioned stimulus. Normally, the unconditioned stimulus results in an unconditioned response but when conditioning or training is involved, it can cause a conditioned response (Horton & Turnage, 1976). On the other hand, operant or instrumental conditioning involves positive and negative reinforcement in order to condition the individual through reward and punishment (Hilgard & Bower, 1975). Another behaviouristic theory is Bandura's social learning theory, which describes learning based on observance or external direction in a social environment, rather than based on physical reinforcement (Bandura, 2001).

Due to its missing enticement system, an understanding of classical conditioning might be more useful to comprehend human behaviour in training, than for the actual training design (O'Doherty, 2004). Although classical conditioning might be relevant for training that focuses on automatic responses, such as fire alarm training, it might be less relevant for employee and management training (Pizzagalli, 2003). In employee training, the announcement of an upcoming training can be seen as an unconditioned stimulus that might cause the unconditioned response of excitement to learn or refusal to attend in employees. At this stage, the organisation can involve a conditioned

stimulus in the form of a consistently positive advertising and presentation of training benefits. This form of communication might lead to the conditioned response that more employees participate in the training. This is supported by Olson and Fazio (2001) who claim that classical conditioning impacts attitudes, which affects reactions and actions. Due to the fact that classical conditioning can only train individuals in simple tasks that involve basic stimulus-response learning, its usefulness for training design is questionable (Clark & Squire, 1998).

Operant conditioning, on the other hand, involves a reward and punishment system that can be useful in training design (Estes, 1972). To give an example, training might be designed in a way which enables participants to reach certain levels of knowledge or skills and the accomplishment of every level contains a positive reinforcement in form of a reward. An utilisation of punishment in training design is not recommended, because this can lead to stress and a diminished willingness to learn and to participate in the training (Cavanagh, 2011). Bandura's social learning theory might be useful in designing training that is based on observations and learning in a social context, such as lectures, presentation, and seminars. It might be less useful for training that includes individual handling of tasks. This can be supported by the fact that Bandura's social learning theory focuses on observation in a social context and not on individual physical activity (Manz & Sims, 1980).

Regarding the critical evaluation of behaviourist learning theories in the context of training design, it can be stated that those theories are more useful for simple training designs, rather than complex training designs, due to a shortage of complex learning. Complex learning is defined as the integration of skills, attitudes and knowledge on a daily basis (Berger & McGaugh, 1965). It can be stated that the behaviourist learning theories limit the possibility of this experience (Light, 2008). In addition to that, behaviourism disregards individual differences in human learning and the influence of personality on learning, which can be considered as crucial elements for the design of training methods. Furthermore, missing perceptual constancy of the stimulus-response system is claimed, which could lead to unexpected responses on training stimuli (Breger & McGaugh, 1965). Due to the importance of measuring progress and results of training, unexpected responses on training stimuli should be avoided (Tziner, Haccoun & Kadish, 1991).

5   COGNITIVE LEARNING THEORIES IN THE DESIGN OF TRAINING

The evaluation of cognitive learning theories focuses on Baddeley's model of working memory and Piaget's theory of cognitive development. The working memory model describes the ability of the brain to function as a temporal storage in order to fulfil cognitive tasks (Baddeley, 2007). The classification into one central executive system, which controls cognitive processes and two slave systems, which are defined as visuo-spatial sketchpad for storing visual information and the phonological loop for storing phonological information (Baddeley, 1992). Piaget's theory of cognitive development describes different developmental stages of human intelligence. The developmental processes from an infant in the sensorimotor stage, until the ability of logical reasoning in the formal operational stages are outlined (Fischer, 1980).

When planning a practice-oriented training design, an understanding of Baddeley's model of working memory might be more useful than Piaget's theory of cognitive learning, due to an increased focus on practical implementation (Baddely & Sala, 1996). According to Vensen and Cardozo (1981), visual training leads to an enhancement in synaptic efficiency. For example, knowledge of the visuo-spatial sketchpad, which according to Baddeley (2007), is based in the right brain hemisphere, could lead to a training that is designed on visual learning. Thereby, methods of visual learning, such as pictures, movies or symbols might be utilized to train employees. This is also supported by Kirby (1988), who mentions visual learning as an important form of knowledge transfer. Furthermore, the phonological loop might be examined in order to design trainings that are more focused on speech-based learning (Baddeley, Working memory, 1992). The phonological loop might be considered when the aim of the training is to acquire language skills (Baddeley, 1998). Such trainings could be designed for future expatriates or employees who are already in foreign subsidiaries. According to Nycz (2013), the acquisition of phonological feature is a pivotal component in expatriation.

Regarding Piaget's theory of cognitive learning, an implementation of gained understanding of the model in training design, appears to be more difficult. Due to the fact that only the formal operational stage refers to adults, possible implementations in employee training design are limited to this stage (Merriam, 2004). The other stages of this model are solely relevant for the education and training of children (Siegler, 2000). An understanding of this stage, which reaches to the approximated age of 20 years, might be considered when designing training for young employees, apprentices, students and trainees who belong to this age category (Herron, 1975). Thereby, a designed training could aim at problem solving and abstract thinking, which are part of the formal operational stage, by designing specific exercises. Training that includes number sequence exercises or rearrange and categorization exercises are conceivable (Bielaczyc, 1995).

A critical evaluation of cognitive learning theories revealed that particular cognitive models are suitable for

training design and others are only partially applicable. When evaluating Piaget's theory of cognitive development, the static classification of the stages could be criticised when comparing it to modern dynamic systems (Nooteboom, 1992). This static view might be negative for the design of dynamic trainings. The design of trainings is a process that requires the ability to dynamically change the learning material and the outcome according to the development of the participants (Buch & Bartley, 2002). Furthermore, a restricted utilization for training of adults is stated (Sutton-Smith, 1966). The main restriction for training of adults is based in a core limitation of Piaget's theory of cognitive development. The model is based on sharp stages of individual learning achievements and fails to regard learning as a process of continuous development. However, modern organizations require methods to measure continuous learning process of employees (Flavell, 1992). Baddeley's model of working memory is criticised for simply naming already known phenomena in a new way (Conway, 2002). Besides the critique of particular models, cognitive learning theories as a paradigm claim to have a high efficiency in terms of training design (Kraiger, 1993). Cognitive learning theories are utilized by educational psychologists, teachers, as well as social and organizational institutions (Cobb & Bowers, 1999).

6   CONSTRUCTIVIST LEARNING THEORIES IN THE DESIGN OF TRAINING

Regarding constructivist learning theories, the theory of problem based learning (Barrows, 1996) and Vygotsky's social development theory (Berk & Winsler, 1995) are set in a context of training design. Problem based learning describes the learning process through problem solving, which is predominantly utilized in educational institutions (Kilroy, 2004). It is a form of active learning that emphasizes a self-directed and self-motivated way of learning (Norman, 2000). Vygotsky's social development theory is based on the assumption that social interaction elicits development. Thereby, Vygotsky distinguishes the theory in three fundamental aspects. Firstly, he claims the significance of social interactions in cognitive learning (Wertsch, 1979). Furthermore, Vygotsky determines the more knowledgeable other and the zone of proximal development. The more knowledgeable is a person who has more knowledge than the student and therefore functions as a teacher (Sutherland, 2004). The zone of proximal development describes the distance between guided and independent learning and problem solving. Learning occurs in this range (Aljaafreh, 1994).

Although problem based learning is predominately used in educational institutions, it might be applicable in an organisational training setting. The training could be designed, in a way that enables employees to work together in teams to solve a specific managerial or customer based problem. Thereby, the process could be guided by an instructor, or the team training could be designed for independent learning, which might encourage the participants to increase their effort of self-directed learning. According to Rosenberg (1995), the condition of working in teams can be helpful when solving a problem. Moreover, Neo (2001) underlines the utilization of problem based learning in employee training, especially when applying multimedia techniques, such as audios, videos and images. A training design that emphasizes an independent problem solving rather than a guided approach, might lead to an increase in self-reliance and decisiveness in the participants (Moore, 1973). These skills, which could be acquired through a training premised on problem based learning, are requested from employees and future managers (Mackay, 2006).

Regarding Vygotsky's social development theory, all three aspects might be implemented in a training design. The emergence of development through social interaction might be useful, when understanding the opening stages, the breaks and the conclusion phase of a training process. The training design could contain an extensive initial phase, in which the participants have time to become familiar with each other and to socialise. This might encourage them to use the breaks and the conclusion phase to recapitulate the subject matter of the training through interaction, which could encourage cognitive learning (McGee, 1992). An understanding of the more knowledgeable other might be useful in understanding the importance of a coach or mentor in the training design. The more knowledgeable other might not even be a human being, but a computer, which operates as guidance in computer-based training and trainings that focus on e-learning (Scardamalia, 1994). According to Allen (2006), mentoring and coaching is a significant factor of success of trainings. An understanding of the zone of proximal development might be more applicable for training evaluation, than for training design. The evaluation of the training could involve the observation of independent learning during the training process (Moore, 1973).

An evaluation of the constructivist learning theories shows a high utilization for training designs that combine self-directed learning with possibilities of socialising, in order to exchange knowledge about independently learned skills (Christensen & Hooker, 2000). When examining problem based learning, criticism in the form of the guidance-fading effect can be stated. This effect describes that in early learning stages a study of worked examples might lead to a better learning effect, than problem solving (Sweller, Ayres, & Kalyuga, 2011). In terms of training design that might lead to an implementation of problem based learning in further training stages. Furthermore, problem based learning is considered as time and cost intensive in comparison to lecture-based learning, which might lead an organisation to prefer training that involves lecturers instead of implementing problem solved learning (Barrows,

1986). Vygotsky's social development theory can be criticised for its heightened emphasis on social interaction and its negligence of individual knowledge acquisition (Hua Liu & Matthews, 2005). In a competitive organizational environment this negligence could lead to a disadvantage for introverted employees and for companies that emphasise individual goal achievement over team-oriented group achievements (Jaramillo, 1996). In terms of training design, this might lead to the consideration of combining social interaction with individual tasks.

7   DISCUSSION AND PRACTICAL IMPLICATIONS

Now that all three learning theories have been examined and critically evaluated under the criterion of usefulness for training design, a discussion shall provide practical implications for the design of trainings in a corporate environment. Therefore, the findings of all three models are used to design a hypothetical training process that contains elements of the behavioral, cognitive, and constructive learning theory. Thereby, the designed training consists of three stages.

The first stage is defined as the behavioral stage. In the first stage, an unconditioned response in form of excitement to learn can be triggered by the announcement of an upcoming training. This can be achieved via internal company newsletters and communication through supervisors. In addition to that, a positive advertising of training benefits can motivate the trainee to attend the training (Batra & Ray, 1986). It can be imagined that the incentive of a promotion or increasing responsibility can be used as motivating factors. Once the trainee attends the training, the first learning goals can be achieved by observing other professionals on the job.

Once the basic principles of the required skills are understood, the cognitive stage can lead to a deeper understanding of the knowledge. In alignment with Baddeley's model of working memory, visual training via video courses and presentations can lead to an enhancement in synaptic efficiency (Vensen & Cardozo, 1981). In addition to that, audio trainings can stimulate the phonological loop, which can lead to an even deeper understanding of the subject matter (Baddeley, 1998).

Once the trainee observed the practical skills on the job and learned the theoretical knowledge by utilizing principles of cognitive learning, constructive learning can lead to the ability to put observed skills and learned knowledge into practice. According to the theory of problem based learning, the trainee now has to solve case studies that require the skills and knowledge of the first two stages. This form of active learning encourages self-directed learning (Norman, 2000). The practical case study can be supervised by a supervisor who functions as the more knowledgeable other, according to Vygotsky's social development theory (Sutherland, 2004). Through exact observation the proximate development can be used to assess the level of independent learning throughout the case study (Aljaafreh, 1994). After the initial training, ongoing mentoring can ensure further development (Allen, 2006).

8   CONCLUSION

Regardless of whether the focus of the particular learning theory lies on behavioural aspects of learning, on cognitive abilities or on the construction of knowledge, a critical evaluation of the theories enables an appropriate application in training design that corresponds to a certain learning theory. The critical evaluation of two theories for each of the aforementioned learning paradigms also reveals that an understanding of learning theories can not only be useful in various forms of training design but also in different stages of training, including the initial phase and breaks. Despite occasional criticism of individual learning theories, the usefulness of an understanding of learning theories in the design of training is evident. The practical implications have shown that training can be designed by using certain learning theories at different stages of the training process. This gives Human Resources Managers more freedom to experiment with training models. In an ideal scenario, the most suitable learning theories can be chosen in regards to specific environments and goals. In addition to that, tests can be conducted in which training outcomes with particular learning theories are measured against each other. Thereby, the understanding of learning theories in the design of training can be continuously increased.

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