

Adaptive Workplace Learning Assistance

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ABSTRACT

Workplace learning has been a part of our lives for a long time already. However, new technological opportunities can radically change not only formal, but also informal (unintentional) learning, which is typical for the workplace. Nowadays companies face a new challenge: the transition towards Industry 4.0. In this regard, information technology should support the whole spectrum of educational methodologies, including personalized guidance, collaborative learning, training of practical skills, as well as meta-cognitive scaffolding.

CCS CONCEPTS

• Applied computing • Education • E-learning

KEYWORDS

Professional learning; Adaptive workplace assistance; Personalized training; Industry 4.0; Internet of Things

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1 Introduction

Workplace learning was defined [1] as “the integrated use of learning and other interventions for the purpose of improving human performance, and addressing individual and organizational needs. It uses a systematic process of analyzing and responding to individual, group, and organizational performance issues. It creates positive, progressive change within organizations by balancing humanistic and ethical considerations.”

Current intelligent tools can process big data and transform work processes, but the related consequences are difficult to predict [2]. In order to be successful, business executives have to consider complementarities of humans and computers. Upskilling of employees should focus on competences that cannot be replaced by machines. The competitive advantage in small and medium-sized enterprises (SMEs) depends on skilled labor and specialization.

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medium-sized enterprises (SMEs) depends on skilled labor and specialization.

2 Workplace Learning Approaches

In the past, alternative approaches were investigated in the area of workplace learning. Transmission and acquisition of well-structured knowledge by means of guidance was a typical objective of *personalized adaptive learning* systems. Later on, *collaborative learning* could be facilitated by Web 2.0 and social software, supporting the creation of new knowledge. Moreover, a lot of attention was given to cultivation of meta-cognitive skills, like motivation, planning and reflection, which are part of *self-regulated learning*. These efforts can benefit from the rapid progress in educational data mining, recommender systems, and learning analytics. The three different types of learning correspond with the basic educational theories of cognitivism, constructivism, and behaviorism. In practice, it is crucial to find a suitable orchestration and balance among them, depending on the concrete objectives and circumstances.

A transition to Industry 4.0 is a complex process, which is very difficult to control and includes change management at the technical, organizational as well as personal level. It concerns both executives and employees. Therefore, it is important to find solutions that make it easier for both sides. This is accompanied by numerous requalification requirements, which demand a radical improvement of workplace learning and on-the-job training.

Ubiquitous sensors and the Internet of Things open new opportunities for the processing of the big educational data, which can lead to a better recognition of the learner's objectives, preferences and context, and consequently to a more precise personalization and adaptation of learning experiences. The effectiveness and efficiency of training and work processes can be improved through wearable technologies and augmented reality. Transparency and understandability of machine decisions as well as clear and manageable privacy rules are key to gain the trust of users.

The full chapter can be found in Augstein, M., Herder, E. & Wörndl, W. (2019). *Personalized Human-Computer Interaction*. Berlin, Boston: De Gruyter Oldenbourg. <https://www.degruyter.com/view/product/490503>.

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