University of Minho & Work 4.0 Consortium

Source / Link: http://work4-0.eu/

Thematic area:	Type of good practice:	Target group:
☒ Transversal competences	☐ Project	☒ VET and adult education trainers
☒ Technical skills	☐ Initiative	☐ Labour market policy experts
☒ Creative skills	☐ Programme	☒ Human recourse management
☒ Social skills	☒ Methods	☐ Others
☒ Contextual skills	☐ Training materials	
	☐ Other	

Summary:

The coming decades will witness to profound social, cultural and economic changes enhanced by rapid scientific and technological advances. New businesses, forms of social organization and work models will bring numerous opportunities for personal and collective development as well as complex challenges of individual well-being and social progress. Professional success will depend on individuals' ability to maintain skills tailored to the needs of a continuously shrinking labour market. Robots and intelligent systems will be increasingly used to perform repetitive and well-defined tasks, which not only include simple tasks but also very complex ones that require high levels of precision. In this context, the scientific and technological skills as well as those that are still specifically human will be fundamental for the future worker.

Detailed description

Skills can be developed in the classroom and outside classroom guided by formal activities designed to lead and assess the student learning. The skills are developed using curricula, programs, workshops, laboratory work, training sessions, projects, company visits and study journey, in individual or group learning approaches.

Learning methodologies can be divided into three categories: expository, guided, and active strategies (Cinque, 2016). The expository strategy includes (1) the lecture where the specialists explores a topic in depth; (2) the seminar that brings together a small group of participants that explore a topic in a participative way; (3) the conference where a set of innovative topics are presented by different speakers and discussed by a large number of participants; and (4) the demonstration where the application of concepts in experiments is used to make their learning easier.

The guided strategy includes the (1) debate that presupposes that topics are discussed from the different experiences of the discussants and the discussion is informed by the scientific knowledge about those topics; (2) workshop adds to the debate the possibility to experiment with the discussed concepts using adequate tools; (3) case study allows for the in depth study of a phenomenon within the context it is unfolding; (4) project work usually allows for the development of a proof of concept (methodological or technological tools that implement a conceptual perspective) or towards the experimentally learning about complex topics; (5) simulation supports the testing of complex decisions, allowing the developing an in depth understanding of their impacts in specific contexts; (6) mentoring allows to facilitate the learning of a student by closely following his/her performance and helping to acquire the knowledge that will allow to overcome faced challenges.

Finally, the active strategy is implemented in (1) brainstorming is a group creativity discussion aimed at raising as many ideas as possible on how to address problems, avoiding pre-judgements about the quality or feasibility of those ideas; (2) role play allows for the embodied knowledge of situations by developing actual experience about challenges and problems; (3) business game is a technique aimed at engaging students in close to reality business situations; (4) visits and journeys are aimed at observing organizational and social contexts where the phenomena are unfolding. This strategy differs from the case study as the student assumes the passive role of an observer instead of the active role of a researcher; (5) outdoor training takes the students outside the classroom to more relaxing environments that may be more stimulant of creativity; (6) coaching is the strategy aimed at defining clear learning steps that the student must follow to achieve the goals jointly defined by the coacher and the student.

Although an initial presentation of concepts and practices may benefit from expository strategies, they induce a passive attitude that is not appropriate with current knowledge that effective learning requires practical experience with these concepts and practices. Learning alters the brain to the extent that it involves integrative cognition: mind and body. Therefore, guided and active strategies have been increasingly applied by trainers and educators. However, the learning of the skills required by the digital and global economy may face various challenges even when using these strategies.

Many processes are being virtualized and the worker must have an effective action both on virtual and physical work environments. The likelihood is that workers will spend more and more time in the virtual work environments where he/she must collaborate and communicate effectively, co-creating solutions, implementing innovative processes and leading teams. This requires that active learning happens mostly in the mind and little is required from body learning. Moreover, the interaction of co-workers is still limited in terms of the emotional and behavioural clues that the worker can access. New technologies are being developed to reduce those limitations by permitting to share sensorial information on the internet, including sound, touch, smell (Aijaz, Dohler, Hamid Aghvami, Friderikos, & Frodigh, 2017; Fettweis, 2014). These are still experimental technologies but once they become commercially available in a large scale, guided and active strategies will be applied for innovative learning processes to develop skills for virtual work contexts.

> In particular, strategies such as case study, project work, mentoring, role play, visits and journeys, outdoor training, coaching will benefit from augmented reality and sensorial technologies to create learning environments where teams geographically distributed can experiment with concepts is a quasi-physically way, enjoying the relaxation and induction of creativity that outdoor environments bring to learning.

Beneficial Results Specially designed learning environments have the potential to revolutionize education and vocational training by customizing learning and freeing the teacher/trainer from gathering and structuring content and context. It will promote technology-enhanced learning in which learners are guided in their real/virtual-world learning by autonomous and intelligent systems that give access to the most adequate digital resources.
Access date: 02/02/2022
Provided by: INI-Novation GmbH