

Tämä on rinnakkaistallennettu versio alkuperäisestä julkaisusta.

Tämä on julkaisun kustantajan pdf. HUOM! Versio voi poiketa alkuperäisestä julkaisusta sivunumeroinnin, typografian ja kuvituksen osalta.

Käytä viittauksessa alkuperäistä lähdettä:

Konst, T. (2017). 'Developing Learning in Organizations with Innovation Pedagogy Methods'. World Academy of Science, Engineering and Technology, International Science Index 126, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 11(6), 1438 - 1444.

URL: <http://scholar.waset.org/1999.10/10007289>

Pysyvä linkki rinnakkaistallenteeseen: <http://urn.fi/URN:NBN:fi:amk-2017082814579>

CC BY

Kaikki julkaisut Turun AMK:n rinnakkaistallennettujen julkaisujen kokoelmassa Theseuksessa ovat tekijänoikeussäännösten alaisia. Kokoelman tai sen osien käyttö on sallittu sähköisessä muodossa tai tulosteena vain henkilökohtaiseen, ei-kaupalliseen tutkimus- ja opetuskäyttöön. Muuhun käyttöön on hankittava tekijänoikeuden haltijan lupa.

This is a self-archived version of the original publication.

The self-archived version is a publisher's pdf of the original publication. NB. The self-archived version may differ from the original in pagination, typographical details and illustrations.

To cite this, use the original publication:

Konst, T. (2017). 'Developing Learning in Organizations with Innovation Pedagogy Methods'. World Academy of Science, Engineering and Technology, International Science Index 126, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, 11(6), 1438 - 1444.

URL: <http://scholar.waset.org/1999.10/10007289>

Permanent link to the self-archived copy: <http://urn.fi/URN:NBN:fi:amk-2017082814579>

CC BY

All material supplied via TUAS self-archived publications collection in Theseus repository is protected by copyright laws. Use of all or part of any of the repository collections is permitted only for personal non-commercial, research or educational purposes in digital and print form. You must obtain permission for any other use.

Developing Learning in Organizations with Innovation Pedagogy Methods

T. Konst

Abstract—Most jobs include training and communication tasks, but often the people in these jobs lack pedagogical competences to plan, implement and assess learning. This paper aims to discuss how a learning approach called innovation pedagogy developed in higher education can be utilized for learning development in various organizations. The methods presented how to implement innovation pedagogy such as process consultation and train the trainer model can provide added value to develop pedagogical knowhow in organizations and thus support their internal learning and development.

Keywords—Innovation pedagogy, learning, organizational development, process consultation.

I. INTRODUCTION

THE most valuable element of an organization is its ability to learn. Improvements in this ability to learn usually lead to better organizational performance. People at work places have to learn new competences continuously, and knowledge has to be transferred, forwarded and adapted. Work tasks today require competences to communicate and interact effectively as well as abilities to train others, but only seldom do the people in these professions have the pedagogical education or adequate knowledge and skills to be able to plan and implement learning processes in best possible way. By introducing working methods efficient in adult learning in internal trainings and meetings can lead to improved productivity in organizations.

This article aims to present how pedagogical competence called innovation pedagogy developed in Finnish higher education can be adapted in various organizations in order to develop learning. The paper describes the innovation pedagogy approach, the tools and methods to implement it, and the ways how these can develop pedagogical competence and knowhow in organizations and support their internal learning and development. The theoretical framework of the article is based on innovation pedagogy and its tools and methods. Innovation pedagogy is a strategic approach to learning, which has not yet been widely utilized outside the educational sector; although, it can offer many tools to meet the challenges met in businesses and organizations.

Innovation pedagogy can be applied in several ways when developing learning in organizations. Process consultation approach can be applied; especially in longer development projects, but also other facilitation methods provided by

innovation pedagogy can make even short ‘train the trainer’ sessions fruitful and have impact on organizational performance. Organizations and their learning can be changed only ‘from the inside’ by involving the staff members into the implementation process, and thus, process consultation can be the appropriate tool for accomplishing the change. In other words, combining the methods and tools of innovation pedagogy concerning, especially change and learning in organizations to the process consulting methods, is a new and innovative approach and can offer new solutions for the development of learning in organizations.

The theoretical framework of the article is put into practice in the description of real empirical cases. In both cases, the client company aims to develop organizational learning by providing a ‘train the trainer’ approach for their employees. ‘Train the trainer’ simply involves training people who in turn train people in their own organization. The first case examines a longer training process emphasizing the process consultation approach, and the second describes shorter one day trainings, their objectives, implementation and results.

The aim is to describe methodological tools applicable for all kinds of companies and organizations, not depending on the size or the field of the organization. The examples in this article are from two real company cases and limited to the methods presented, but the innovation pedagogy approach and its methods are applicable and useful for all organizations and can be tailored to different situations demanding changes in organizational learning. The managerial outcome of this article is to provide tools of innovation pedagogy for organizations; how to generate knowledge together, how to share knowledge, and how to learn from each other.

II. INNOVATION PEDAGOGY FRAMEWORK

Innovation pedagogy is a strategic approach to learning, which has not yet been widely utilized outside the educational sector. Traditionally, education has emphasized individual learning, which, in the end of education, is evaluated on the basis of learning outcomes of an individual. The more dependent of each other we become in the networked world, where everything has impact on everything, the more we need good team players and collaborative experts. Innovations seldom are individual outputs but results of that how we share and combine knowledge together. Ability to participate into innovation processes and be successful in working life requires innovation competences, which education should provide all their students with in addition to study-field specific competences. The learning approach called innovation pedagogy aims to develop innovation competences of

T. Konst is with Faculty of Technology, Environment and Business, Turku University of Applied Sciences, 20700 Turku Finland (phone +358-44-9074588, e-mail taru.konst@turkuamk.fi).

individuals and groups. Innovation pedagogy refers to an approach to learning answering to the needs of working life while emphasizing R&D expertise. In the approach, learning and teaching methods are applied creatively and in a value-adding way so that the learners take responsibility for their learning and actively strive to reach their learning goals. The aim of innovation pedagogy applied in higher education is that graduating students are innovative and oriented towards different development tasks, which means that they have acquired, in addition to the expertise on their own study field, so-called innovation competences expected in all working life environments, enabling them to take part and contribute in innovation processes in these environments [1]. In brief, innovation competences are learning outcomes that refer to knowledge, skills and attitudes required for the innovation activities to be successful [2], [3].

Innovation pedagogy is based mainly on the socio-cultural and the constructivist view of learning developed to encompass the social and cultural customs and means of a particular community. This approach extends traditional individual based learning used in many contexts to include, and emphasize, collaborative and networking based learning in order to support innovations. According to innovation pedagogy learning cannot be separated from the world around us, because the cultural models and ways of operating always steer learners and their activities. The relating sociocultural theories [4], [5] underline the need to define the cultural toolkit and ways of operating in learning in the context of the specific time and place. The way how we understand our cultural environment and solve problems is crucially influenced by the everyday activities in which we take part and this places a special emphasis and consideration on learning environments, in which pedagogical solutions are applied and implemented in practice.

A learning environment is often understood as the physical or virtual surroundings planned and built for learning purposes. Innovation pedagogy highlights the social aspects of learning, and group processes and interpersonal relationships where learning takes place in various, often multidisciplinary teams, constitute a crucial part of the learning process. According to innovation pedagogy, social learning environment is made up by people with various backgrounds, qualifications and competences, and by the interaction which enables collaborative learning. Equally, the work tasks in working life organizations often require knowledge, skills and competences which do not go to the scope of a single discipline or field of study [6], [7]. The terms used about social learning environment such as boundary crossing or cross-, inter-, and multidisciplinary, lack a single comprehensive concept, but they all share the same goal to generate something new, unexpected and innovative through collaboration of people with different expertise and backgrounds. Each individual involved in this kind of co-operation contributes his/her own knowledge, personal history, experiences, expertise, skills and attitudes to the social learning environment.

Innovation pedagogy promotes, in addition to the central

role of the learner, practical activities as well as creating, constructing and cumulating knowledge. Scientific knowledge facilitates practical problem-solving, but sometimes a new practice originates from an immediate need in a practical situation resulting in a scientific breakthrough. Also, in the area of learning theories in general the interplay between theory and the practices in which theories are applied and implemented can be increasingly observed. Collaborative learning enables different actors to work together in dialogue and in interaction in such a way that their own expertise can be efficiently shared and combined in new ways resulting in something more than the sum of its parts. [4], [8], [9] In all fields of knowledge creation we are encountering challenges how to create added value required to maintain our welfare level, challenges and wicked problems which are becoming increasingly difficult to solve within the framework of a single method, be that a discipline, a profession, or an expertise area. Simultaneously, we need to keep in mind the fact that knowledge is at the core of innovation and that innovation usually emerges at the boundaries of different knowledge domains. Our economies, as well as the success of future companies and organizations, is more and more based on innovations, which are created by innovative employees capable of not only creating and inventing something new by themselves, but also of participating in the processes where new ideas and solutions are created in co-operation by working together. The goal of innovation pedagogy is to bridge the gap between education and working life. Learning and teaching processes are developed in a way that ensures the development of innovation competences and study field specific competences of the students and enables their personal and professional growth. Learning is seen to be deeper and enduring when previously gained knowledge and skills are continuously applied to practical situations and contexts. A learning process which resembles an innovation process develops knowledge and skills and enables creation of new services, products, and social or organizational innovations, all generating new added value [10]-[14].

Fig. 1 describes innovation pedagogy in a nutshell, i.e. which are the aims, process and tools of innovation pedagogy.

The aim of innovation pedagogy is to educate learners who can succeed in their future working positions. In other words, they will be able to participate in innovation processes in their future jobs so that innovations are created. To reach this aim they have to develop their innovation competences alongside with their field specific competences during their learning path in the studies. Different phases in the innovation process emphasize different knowledge and skills, so it is necessary that the learning process itself is planned according to the innovation process.

The cornerstones, or tools, of innovation pedagogy are presented in the beginning of the arrow. These include activating learning and teaching methods, working-life orientation, integration between studies and applied RDI activities, flexible curricula, multidisciplinary learning environments, development-oriented and versatile assessment, entrepreneurship, internationalization, and renewing teacher

roles from teacher to coach and co-learner, all together contributing to the development of learners' innovation competences.

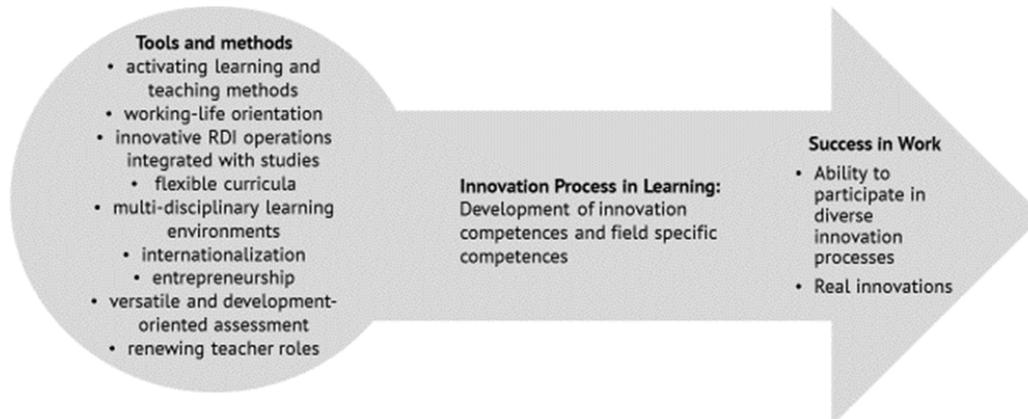


Fig. 1 Innovation pedagogy in a nutshell [15]

III. IMPLEMENTING INNOVATION PEDAGOGY IN ORGANIZATIONS

Developing learning in organizations usually means that more or less changes are needed. Applying and implementing innovation pedagogy in organizations means that there are means and tools to develop learning in the organization, but in order to apply them there is a need for changes in ways of action. Schein [16] states that change is a process with specific logical stages and that various mechanisms of change have to be managed at these stages. The first stage called unfreezing must provide disconfirming information and connect it to significant personal goals or ideals so that guilt or anxiety will be felt, and at the same time it has to provide enough psychological safety so that the disconfirming information will be attended to and not denied. If the target group through these mechanisms becomes motivated to unlearn something and replaces it with some new learning, they will do so either by the mechanism of identifying with a new motivating role model or by scanning the surroundings for information most relevant to the problem. The actual change taking place can then be seen as a cognitive restructuring/redefinition of the problem that leads to new perceptions, ideas, judgments and ultimately new behaviors. Finally, the change process will be completed when these new responses and reactions are tested for fit with the rest of the self-concept, personality and the learner's relationships. Schein states that only when the new responses are confirmed by important others we can say that the change has really been stabilized [16], [17].

The term process thinking refers to an approach which plays an essential role in development challenges in organizational learning. It gives guidelines how to help people to make changes, how people get committed to the changes and how to learn to conduct changes in an organization. The aim of process consulting is to create opportunities for planning and implementing changes, and therefore, it provides often a practical framework and methods for organizational development and learning.

The major motivation for process consulting is to help

people in organizations to help themselves, i.e. the consultant working with and not for the customer is the leading principle in the process consultation philosophy. In other words, process consultation is an organizational development tool where the target group participates in the development of their own work processes and work community. As a development method it underlines the responsibility and central role of the customer in the process. These elements of involvement have a positive impact on the customer's feeling that he/she really owns the process. This sensation adds to the customer's commitment to the issues such as decision making and practical actions, which are both relevant for success. When the target group members are involved in the development process and given decision-making power, their commitment to the implementation is increased significantly.

Process consultation and management consultation are often defined as reverse concepts; process consultation is frequently seen by its promoters as a better and more efficient style of consulting. However, in practice, almost all management consulting involves a mix of expert and process approaches, where the consultant frequently has to shift roles between both approaches to meet the needs of the situation. Anyhow, process consultation most certainly has many strengths and benefits. Compared to experts who offer packaged solutions that may have general validity but in fact are not the best solution for the organization, process consultation has the powerful benefit of being by its nature especially tailored to the specific situation.

The process consultation process can be divided in several stages, the first being the first contact with the potential customer. The aim of this stage is to find out if the consultant has opportunities to help the customer, and whether the customer can really benefit from the consultation. The next stage is the consulting relationship to be defined (including e.g. expectations and customer roles) and outlined (e.g. objectives and schedules), and the working methods are settled. At the stage of information gathering and diagnosis insights into 'what really goes on' are needed next. There are

lots of different diagnosis models available, but it does not mean that there in every situation must be a diagnosis period followed by an intervention period, because in reality, intervention begins in the very first customer contact. In fact, everything a consultant does from the moment of the customer contact with the consultant is an intervention of some kind, and therefore, it is important to underline intervention as central. In other words, there is no diagnosis period prior to intervention though many consultation models present it as such, but they are often going simultaneously. However, diagnosis models can help to anticipate and evaluate the situation, but it is good to remember that both diagnosis and intervention are both instantaneous and perpetual processes. Finally, there is the stage of closing, where the consultation process includes the evaluation procedures of the process [16].

Process consultation method is a smooth way to implement innovation pedagogy because both approaches aim to help people to help themselves, i.e. no ready answers are offered but sharing of knowledge and experiences are emphasized. Process consultation can be applied, especially in longer learning development projects, but also other facilitation methods provided by innovation pedagogy can make even short 'train the trainer' sessions fruitful and have impact on organizational performance. 'Train the trainer' simply involves training people who in turn train people in their own organization. The train-the-trainer or the TTT model, which in the literature is also called pyramidal, triadic, or helper model training, focuses on initially training a person or people who, in turn, train other people at their home agency. The main advantage of the train-the-trainer model is its promise of being both efficient and cost-effective [18].

IV. DEVELOPING LEARNING IN ORGANIZATIONS

In the world of dynamic changes and in global competition, organizations need to learn more than ever. Each company must become a learning organization. The concept originates from the 1990s, stimulated by Peter M. Senge's *The Fifth Discipline* [19], as well as many other publications and research reports. The outcome was a vision of an organization made up of employees skilled at creating, acquiring, and transferring knowledge. Such learning organizations would be able to adapt to the unpredictable more quickly than their competitors could. In order to develop to a learning organization, a supportive learning environment has to be created. A supportive learning environment provides psychological safety, so that participants must be comfortable expressing their thoughts about the work at hand. It has appreciation of differences, because learning occurs when people become aware of opposing ideas. Third, there is openness to new ideas, which means that employees should be encouraged to take risks and explore the untested and unknown. A supportive learning environment also provides time for reflection enabling employees to become able to diagnose problems and learn from their experiences [20]. Also, changes in work encourage organizations to develop learning among their employees more than ever, there is more working in teams and projects, and work tasks require collaboration as

well as transferring and creating knowledge together. Most work tasks nowadays include training and educating other people, but often the people in these positions lack pedagogic competence how to plan and implement learning as well as how to assess the outcomes; i.e. whether real learning has taken place. Additionally, transfer of learning, i.e. the dependency of human conduct, learning, or performance on prior experience, can make it challenging to develop learning in organizations, because people tend to act as they have done, or learnt, earlier. For example, there can be a belief that by listening to a lecture or by reading a book guarantees that content has been learned. It is not always understood that activating and participatory learning methods, such as discussing and sharing knowledge with others and practice by doing, provide essentially better learning outcomes than passive learning methods such as reading or listening. Therefore, developing learning in organizations often needs to be started with discussion on participants' beliefs on learning.

In the following, the theoretical framework is described in practice with two authentic case studies. The consulting party here was Turku University of Applied Sciences (TUAS) where the consultants came from TUAS Innovation Pedagogy research group.

A. Case 1: A Longer Development Process

In the development process described here, the customer is a global, Finnish-based company in technologies, especially for the marine and energy markets. It operates in 70 countries and has its biggest outlet in Finland, where this development process took place. The aim of the development process was to improve the training competences of the internal trainers of the company. These trainers organize customer trainings, and the company aimed to improve the impact of these trainings. The participating trainers did not have earlier studies in pedagogics.

The first contact leading to the learning development process came from the customer's suggestion. There had been some co-operation activities between the organizations earlier and the customer had heard about innovation pedagogy implemented at TUAS. After discussion on the TUAS approach available and approval of financial arrangements, it was decided that a contract on the development process could be made. The aim of the agreement focused on the pedagogical competence development of the trainers in customer organization including, in particular, the application of innovation pedagogy learning methods. The development process was planned to take about half a year.

The process was started with information gathering and diagnosis, in addition to discussions with customer, with a situation analysis with the participants where they described the concerns and needs related to the current situation. This diagnosis and analysis stage was necessary for making a roadmap for the development process and it was conducted by the participants. However, it must be stated that the diagnosis stage actually took place during the whole process. The stages of problem definition and solution searching are more or less interconnected, in other words, the problems to be defined

when the objectives are compared with the current situation. It is typical for a longer consultation process that the diagnostic work is needed during the whole process e.g. after every intervention. The diagnostic stage in the beginning of the process revealed the current situation in the organization concerning the change process. The unfreezing stage had already taken place, because there was anxiety concerning the current situation, and the participants were evidently motivated to unlearn something and replace it with new learning. There was no negative feedback from the earlier customer trainings, but because these trainings were no longer free of charge for customers, the company and its trainers wished to ensure the impact and further improve the success of the trainings.

The interventions during the development process were numerous. The working methods in trainings were decided to include e.g. consultation focusing on interviews, observations, one-to-one and group discussions, and collaborative seminars implemented with innovation pedagogy methods. The implementation was structured according to Fig. 2. The first training day focused on topics on learning, such as understanding of learning, learning and teaching methods according to innovation pedagogy and assessment of learning. The participants were instructed to adapt the best practices into their own work. There were no ready-made solutions offered to the participants how to implement their own trainings, but the idea was to widen their awareness about different approaches available and their impact on learning. The approaches and learning methods discussed and tested focused on methods which according to innovation pedagogy are the most successful in adult learning, such as different participatory and collaborative methods. The trainers from TUAS went to follow each participant's customer trainings in authentic situations, after which, an evaluation discussion was organized between the trainers and the participant/company trainer. Thus, each participant received personal feedback and made a personal development plan together with the trainers. Later, one more training day was organized based on the needs found in the follow-up, mainly focusing on the methods to facilitate learning. A few months later, a follow-up workshop with the participants was conducted in order to evaluate the impact of the training process, especially on the customer

trainings. The working methods during the whole training process originated from innovation pedagogy; all interactions were based on dialogic and collaborative learning, the participants with different backgrounds were challenged to discuss, share experiences and learn from each other. Special attention was paid to the social learning environment in order to create a safe and relaxed atmosphere to encourage discussion and sharing of experiences. Self-assessment and reflection were emphasized to make people aware of their own thoughts of learning and to challenge their earlier ideas. According to process consultation approach, the trainers did not offer any ready-made solutions; however, the participants were encouraged to make their own decisions how to develop their own trainings.

The evaluation stage continued during the whole process, in other words there was both diagnostic, formative and summative evaluation conducted during the process, which helped in reacting immediately to upcoming new questions and supported in targeting of new interventions. It was said earlier that the change process will be completed when new responses are tested for fit with the self-concept and personality and within the participant's relationships. In the final feedback, the participants brought up that the development process had given support and encouragement for own thoughts to which direction the trainings should be developed. The process had provided many practical ideas to the implementation. Especially, the topic of learning methods was seen as the most useful part of the content, i.e. various learning facilitation methods and versatile methods in dynamic learning situations. Understanding of adult learning was mentioned to be increased. The competence of learning assessment was mentioned to be improved, which is important when the impact of training has to be measured and evaluated especially in customer trainings. On working methods, open discussion, sharing experiences and learning from others were mentioned as the most fruitful methods used. However, the main problem was that the most of participants felt their possibilities to put new pedagogical ideas to practice are limited because the lack of time. Planning and implementing the trainings in new ways needs time for reflection and requires collaboration with colleagues, which were mentioned to be big challenges in the hectic working environment



Fig. 2 Interventions in the training process

B. Case 2: A Short Train the Trainer Process

The process consultation approach was applied in the above described development project, but also other facilitation methods provided by innovation pedagogy can make even short 'train the trainer' sessions fruitful and have impact on organizational performance. 'Train the trainer' simply involves training people who in turn train people in their own organization. The TTT model has the promise of being both

efficient and cost-effective training method. The customer company using 'train the trainer' model in this case is one factory plant of a global food industry company. This company has four outlets in Finland having about 500 employees. The factory plant requesting 'train the trainer' training had met the problem their employees having more and more training tasks internally but missing pedagogical competence. There was uncertainty whether their trainings had

the desired impact, i.e. whether real learning took place. Additionally, the methods and criteria for assessing the impacts of trainings were not familiar for people acting as internal trainers.

It was agreed to organize some 'train the trainer' workshops aiming to develop pedagogical competences of participants in implementation of various training sessions. The 'train the trainer' trainings were implemented as interactive workshops, emphasizing collaborative methods as well as the participants' readiness to bring their own thoughts and experiences to the common discussion. These workshops were one day trainings, organized three times for different groups, group size being from eight to 13 people. The contents focused on topics such as understanding of learning (learning styles and ways, adult learning, collaborative learning and group dynamics), learning and teaching methods according to innovation pedagogy (facilitation methods, versatile methods in various learning situations, choice of learning environments and materials) and assessment of learning (how to ensure learning, versatile and development oriented assessment methods, reflection in assessment). The feedback was collected after the trainings. In addition, one more workshop was organized few months later as a follow-up seminar. The experiences and best practices were discussed and future actions planned together.

According to the feedback, these short workshops improved the internal trainings of the company and enhanced their impact. According to the HR manager, "there is no negative feedback at all, the trainings were useful and gave more than we expected. We received a lot of ideas and practical hints on how to implement future trainings. The trainings were very pragmatic with real examples. From the viewpoint of the training providers, the trainings were maybe even too efficient, because now we are able to implement similar training for other staff members according to the same model."

V. CONCLUSION

Process consultation can help in the learning development of organizations, and collaboration is in the core of it. Staff members participate in the development of their own work processes and the working community. The commitment to the development process can be improved considerably by taking the participants along to the development process from the first start and given them an active role and decision-making power. The case examples show that innovation pedagogy can be used for the learning development of organizations with process consulting, but the objectives must be realistic and applicable in the specific organizational context. Innovation pedagogy tools and methods can be utilized to develop an organization's practices and ways of working, but a more holistic and sustainable change requires intervening in also processes, for example, by providing the participants both opportunities and resources to plan, implement and assess new ways of action. Concerning the case examples described earlier, further development will depend a lot whether the anchoring of the new actions to the practices and processes will be conducted. However, in the

development of learning in an organization, process consultation approach and innovation pedagogy methods can be the most powerful tools in order to conduct real change. With process consulting it is possible to improve the customer's own performance and initiative on a sustainable basis, and thus, the bigger the needed change is, the more process consulting can help the customer and the organization. Innovation pedagogy methods can widen and renew understanding of learning in organizations as well as offer practical tools to improve learning, and therefore, change the ways of action in all training situations.

The development of learning assessment methods is a valuable outcome of adopting innovation pedagogy approach. It is difficult to develop a clear understanding of the current situation of competences or to set targets for the future competences which the trainings aim to provide, without an accurate set of relevant indicators and management of appropriate assessment methods to guide the learning process and evaluate it. The assessment methods and tools of innovation pedagogy make it possible to evaluate the impact of innovation pedagogy trainings as well as the trainings implemented by the training participants. The managerial and financial evaluation of trainings can be ensured which has a direct impact on the evaluation of organizational learning and development.

REFERENCES

- [1] T. Penttilä, L. Kairisto-Mertanen, A. Putkonen, and A. Lehto, "Innovation Pedagogy – A Strategic Learning Approach for the Future," in *Pedagogical views on innovation competences and entrepreneurship*, A. Lehto and T. Penttilä Eds. Tampere: Reports from Turku University of Applied Sciences 171, 2013, pp.11-23.
- [2] L. Kairisto-Mertanen, T. Penttilä and H. Lappalainen, "Fostering Capabilities for Continuous Innovation in University Education," in *2012 Proceedings of 13th International CINet Conference*.
- [3] J. Kettunen, T. Penttilä and L. Kairisto-Mertanen, "Innovation pedagogy and desired learning outcomes in higher education," in *On the Horizon*, 2013, Volume 21, Issue 4.
- [4] L. S. Vygotsky, *Ajattelu ja kieli*. Espoo: Weilin & Göös, 1982.
- [5] R. A. Walker, K. Pressick-Kilborn, L. S. Arnold, and E. J. Sainsbury, "Investigating Motivation in Context: Developing Sociocultural Perspectives," in *European Psychologist* 2004, Vol 9(4), Dec, pp. 245–256.
- [6] T. Penttilä, and L. Kairisto-Mertanen, "Learning Innovation Competences through Boundary Crossing in a Social Learning Environment," in *2012 Proceedings of EDULEARN2012 Conference*, Barcelona.
- [7] T. Penttilä and A. Putkonen, "Knowledge in the Context of Innovation Pedagogy in Higher Education," in *2013 Proceedings of INTED2013 Conference*, Valencia.
- [8] E. Wenger, *Communities of Practice: Learning, meaning, and identity*. New York: Cambridge University Press, 1998.
- [9] K. Hakkarainen, K. Lonka, and L. Lipponen, *Tutkiva oppiminen*. Helsinki: WSOY, 2001.
- [10] M. Gibbons, C. Limoges, H. Nowotny, S. Schwartzman, P. Scott and M. Trow, *The New Production of Knowledge. The dynamics of science and research in contemporary societies*. London: Sage, 1994.
- [11] L. Kairisto-Mertanen, T. Penttilä, and A. Putkonen, "Embedding innovation skills in learning", in *Innovation and Entrepreneurship in Universities*, M-L Neuvonen-Rauhala ed. Series C Articles, reports and other current publications, part 72, Lahti University of Applied Sciences, 2010.
- [12] I. Nonaka & H. Takeuchi, *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, New York: Oxford University Press, 1995.
- [13] H. Nowotny, P. Scott, and M. Gibbons, *Re-Thinking Science*.

Knowledge and the public in an age of Uncertainty. London: Polity Press, 2001.

- [14] H. Nowotny, P. Scott and M. Gibbons “Mode 2 Revisited: The new production of knowledge,” in *Minerva* 2003, 41(3), pp. 179–194.
- [15] T. Penttilä, L. Kairisto-Mertanen, A. Putkonen, and A. Lehto, ”Innovaatiokompetensseja innovaatiopedagogiikan avulla”, in *Kestävä Innovointi*, T. Rautakorpi, A. Mutanen, L. Vanhanen-Nuutinen eds. Helsinki: Unigrafia, 2014, pp. 156-171, modified from the figure p. 165.
- [16] E. H. Schein, *Process consultation*, 1987, volume II. USA: Addison-Wesley.
- [17] E. H. Schein, *Yrityskulttuuri. Selviytymisopas*, Helsinki: Suomen Laatu keskus Koulutuspalvelut Oy, 2001, pp. 131–156.
- [18] G. W. LaVigna, L. Christian, and T. J. Willis, “Developing behavioural services to meet defined standards within a national system of specialist education services,” in *Pediatric Rehabilitation*, 2005, 8:2, pp. 144-155.
- [19] P. M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, United States: Currency.
- [20] D. A. Garvin, A. C. Edmondson, and F. Gino, “Is Yours a Learning Organization,” in *Harvard Business Review*, 2008, March.