Integrative Action and Process Model

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Abstract: - The main contribution of the Integrative Action and Process Model is the creation of sustainable and linear framework for cyclic innovation activities. The object of Integrative Action is to integrate the University of Applied Science’s three statutory tasks of education, research and development, and regional development. The proposed Integrative Action and Process Model for the integrative implementation of the three tasks is developed, tested and used in the master and higher education studies in services, service design, security and ICT in Laurea University of Applied Sciences during 2001 to 2008. The Laurea is a research and development oriented University of Applied Sciences and it focuses on service innovations producing high-quality professional competences. Its specific task is to foster collaboration, international competitiveness and regional development of the Helsinki Metropolitan Area. The concept of Integrative Action and the culture, approach, and framework of Learning by Developing are created as tools for the practical realization of the triple tasks in an integrative way. This will also guarantee the sustainability of the integration of the three tasks with one another and with international cooperation and the employment sector. The focus of the Integrative Process implementation is the transformative full duplex usage of cyclic innovation activities, linear development orientation and, quality and relevance action in the realization of: (1) knowledge-acquisition, (2) participation and (3) knowledge creation. The theoretical background consists of Learning by Developing (LbD) framework in the perspective of networked expertise process.

Key-Words: - education, integrative learning system, transformations, integrative process, higher education, networked expertise

1 Introduction

Generally, there are three main statutory tasks for Finnish Universities of Applied Sciences, these are: education, research and development, and regional development. A design-science and constructive research problem for Universities of Applied Sciences is how to integrate these three statutory tasks. The results of this study describe the implemented processes of collaborative and Integrative Learning Environment concept and realizations. The process concepts and models are tested and integrated into education, research and development work within the learning environment. This study is focused on Integrative Action, its processes and its impact on the development work accomplished through the everyday operations in case of Universities of Applied Sciences. The tasks of the Universities of Applied Sciences described in the law includes: master and higher education that responds to the working life and its development needs, and are based on research and artistic principles; applied research and development work that fosters regional development and takes into account the structure of the area; and support for individual professional growth. Based on these triple tasks, Universities of Applied Sciences are closely linked to the working life and cooperate with regional participants and actors. An integrative process and a model for cooperation work in international and regional development are developed. The new process and model enhance the integrative role of collaborative action and quality in the realization of the three statutory tasks. This study, as a design-science research is based on constructive developing and analyzing work done at Laurea University of Applied Sciences in Espoo and in cooperation with the Helsinki metropolitan area during 2001 to 2008. The implementation cases of this Integrative Action process study includes: (1) Bachelor level of Higher Education in Hospitality Management, Security and ICT with 1120 students; and (2) Master level of Higher Education in Service Management and ICT with 56 students. The results show that Integrative Action and LbD culture have effects on the activities of the Universities of Applied Sciences and the Finnish society in general. The contribution of the Integrative Action and Process Model is the creation of sustainable and linear process framework for cyclic innovation activities.
2 Problem Formulation

In this study the research question and problem is that what like processes and action models contributes activities which are consisting and implementing the University of Applied Science’s three statutory tasks education, research and development, and regional development. The study’s processes implementation perspectives are: (1) the knowledge-acquisition, (2) the participation and (3) the knowledge-creation. [5]

In this study it is obvious to use the design-science - and constructive research approach including action research for process formulation [6], following concepts of constructive research are applied; (1) creation, evolution and execution of Integrative Action and Process Model, and (2) evaluation of experimental implementation. The study result bases on collected best practices and empirical data which are collected at Laurea. Laurea performs continuous action research of own processes and it has several online databases and data collections allowed for research and developing purposes.

The main theoretical background of Integrative Action includes a combination of concepts, models, and innovation development theories with pedagogical approaches as for criterions to process models development.

2.1 Pedagogical Literature Formulation

Engeström (1999) has studied innovative learning cycles in teams using the cultural-historical activity theory and the theory of expansive learning as a framework for his analysis. He emphasizes on the phase of knowledge creation where problems are formulated and analyzed in the first place. Expansive and innovative learning starts by criticizing, questioning and analyzing existing practices. Focusing dialectical tensions, contradictions, and within communal activities, these are usually ignored by approaches focusing on immediate empirical generalizations. The model is to be understood by analyzing more different elements in an expansive learning cycle, whereas innovative learning cycles do not follow any fixed order [3].

Bereiter and Scardamalia (2003), both are strong advocates of student communities working together to become proficient in fields of knowledge. They introduced the concept of knowledge-building communities, where students learn to work with theoretical and practical concepts as objects. They advocate strongly that students become knowledge-builders and participate in the knowledge-building discourse. The “focus is first on problems and depth of understanding is second” in case of decentralized, open knowledge environments for collective understanding, and “third thing is in productive interaction within broadly conceived knowledge-building communities”. [4]

According to Hakkarainen, Palonen, Paavola and Lehtinen (2004) networked expertise refers to competencies that arise from social interaction, knowledge sharing, and collective problem solving and are embedded in shared competence of communities and organized groups of experts and professionals. Cognition and intelligent activity are not only individual mental processes but ones which rely on socio-culturally developed cognitive tools, these also includes physical and conceptual artifacts.

Networked expertise is rational in nature. It is constituted in interaction between individuals, communities, and larger networks supported by cognitive artifact, and it coevolves with continuously transforming innovative knowledge communities. The approach emphasizes on the development of expertise, distributed cognition and shared expertise, collaborative and cultural learning, and inquiry-based learning processes.

Hakkarainen et al. (2004) continues that learning is constructed out of three perspectives. The first (1) perspective is a metaphor for acquisition, conceptualizing learning as a process of transferring knowledge to an individual leaner. The second (2) perspective is a metaphor for participation, which emphasizes the role of social communities in learning and professional development. The third (3) perspective is a metaphor for knowledge creation, whose aim is the purposeful generation of information and the development of related social customs. [5]

2.2 Related Models Formulation

The Integrative Action and Process Model is developed within Learning by Developing (LbD) framework and with using of the Onion model’s actors and variables. The integrative work consists innovative and cyclic activities as well as linear development work and so changing of objectivity principles are related and supported in Integrative Action and Process Model.

2.2.1 Learning by Developing (LbD)

Learning by Developing (LbD) is a pedagogical and communal approach in which learning is linked to applied research and development projects and culture. It means learning expertise that arises from social interaction, knowledge and competence sharing, researching and problem solving of
collective objects. The model emphasizes on cooperation and creating a “learning and developing” culture and makes it possible to include and use various scientific perspectives and methods of learning, researching and developing in operation and action. The model represents a management and work philosophy and culture based on the production of shared competence and creativity. In the current developing culture there are genuine research- and development tasks; there are no ready-made solutions. The learning process starts by identifying the initial scope or strategic research object, analyzing and describing it, and selecting appropriate work methods. The model is not applicable for solving problems set in advance by someone else. Neither does it support the commissioned project principle, because the creative starting points are determined by the cooperating participants of the value network, often together with professional developers from research and development organizations. The creative objects of the work is usually not possible to define clearly in advance, but is specified throughout the development process. The process requires critical thought strategies and skills for justifying solutions and evaluating evidence. Work consists of a continuous developing process, focusing on research, development and generating new competence. [8]

2.2.2 Onion Model
Fränti & Pirinen (2005) proposed Onion - or co-operation model for integration of LbD and regional development work as well as international cooperation and globalization. The Onion model can be referring to an enhanced version on the Integrative Action and Process Model in perspective of actors and variables.

Laurea’s operations are steered by its strategic intent, which is to be a fully authorized and international University of Applied Sciences participating in innovation activities. In terms of regional and global development, “fully authorized” refers to carrying out applied research and development work serving regional development, in accordance with the quality criteria set for the European Higher Education Area. [7]

Laurea is an operator in regional development, and the regional development task is linked to the whole education task. In terms of international relations, Laurea enriches its area of operation with international top-level expertise and promotes its internationalization. For learners, Onion model means increased opportunities and the inclusion of increased international interaction in studies. Laurea’s learners are equal participants in integrative learning environment development groups, which also include lecturers, partners and researchers. Fig. 1 illustrates the Onion Model:

In the Onio model; the network of Integrative Action creates an enriching community of knowledge and practice. Innovation researchers emphasize the importance of people’s spirit and flow in innovation work. Innovations arise from individuals and their interaction. An “enriching community” means the interactive relationships that link innovative individuals together and to their region.

In terms of innovation, the applied Onion model implementation strengthens the innovation capacity of its area of operation and creates favorable conditions for the birth of innovations.

2.2.3 Elasticity of Boundary Objects
Star & Greisemer (1989) proposed the concept of the boundary object as a trialogical artefact offering a perspective on joint studying and team work. The boundary object conforms to both individual and collaborative efforts, and stands for culturally embedded, object-focused activity.

According to Star & Greisemer (1989), the boundary objects are objects which are plastic enough to adapt to local needs and the constraints of several parties employing them, yet robust enough to maintain a common identity across sites. They are weak-structured in common use, but become strong-structured in individual use. The objects may be abstract or concrete [1].

Pirinen (2008) proposed Elastic objectivity which is especially desirable where the approach is innovation based and creativity is emphasized. It is creativity support element for way of transformation to innovation orientation. The Elastic Objectivity refers to entity for creativity in general. It means that
nature of objectivity is supporting structures for creativity and innovation. It’s meaning and contributing aim is improvements of creativity, interest and use of creativity for innovations. Furthermore, it gives the possibility that “valuable output results are not well known in beforehand”, and way of action that “innovation results are evaluated but not formalized and valued in advance”. The perspective refers to synthesis of objectivity, subjectivity and value. The Elastic Objectivity may be partially seen thought question: what like objectivity supports creativity in cases of where “be based on things” and judgments for objectivity are not possible perceived in advance and variables of objectivity are early and unstable state during creativity process. The other question is how the subjects (teacher, experts, students and other participants) may manage flow and spirit of innovation work and use perspective of objectivity as helping and supporting forces for communal creativity.

The difference between elastic objectivity (creativity perspective) and boundary objects (teamwork perspective) is that the elastic objectivity is above boundary violations and it emphasizes the possibilities for general creativity. This also means and or leads to emphasis on inspiration and creativity supporting structures.

### 2.2.4 Changing of Objectivity Model

Pirinen (2008) proposed Changing of Objectivity Model which states that the nature of objectivity is changing and in relation as well as depending on the perspective of orientation. The model emphasizes the role of different orientations. In the reactive model-based orientation, only few innovations and new competencies creation exist. In the problem-based orientation, basic idea and development objects are usually well known and defined. The traditional research questions and objectives are usually formulated and fixed. The elastic objectivity (entity for creativity) is desirable where the approach is innovation based and proactive. Flexibility and resiliency of development objects are needed to give room for more inspiration, motivation, spirit and flow to individuals and participants as well as to innovation power in cyclic innovation process. [9]

In the innovative orientation, the incepted objectives are like modelling clay, flexible, dynamic or resilient than specified, defined or formal. The development and its process for implementation integrate cyclic innovation process with more constant and linear development process. This change is full duplex cyclic-linear transformation. Changing of objectivity is illustrated in Figure 2.

From other perspective, the model presents development of new competencies, where the synthetic transformation variables are; from reactive to proactive, from defined to elastic or resilient, from formal to flexible and from linear to cyclic and of course vice versa.

The “synthetic transformation” in Learning by Developing (LbD) concept emphasizes that the term “synthetic” is not the same as compromise. It is the integration of different and opposing aspects through a dynamic and elastic process. The synthetic transformation is achieved through trilogy and action is based on shared context which has meaningful link to elastic objectivity. “Meaningful” is emphasized because it creates motivation for needed knowledge acquisition. The synthetic transformation process starting point may be the objective or object of innovation system, the “why” and “what” questions has to be clear enough at this level. The synthetic transformation process may continue through shared elastic objectivity by using “freedom within framework” principle, where an inside participant has rights and power to develop, make decisions and evaluate value prospects.

Pirinen (2008) continues that the Changing of Objectivity Model describes the necessity for different orientations, in other words, all orientations are important and needed. The model also emphasizes the relationship among vitality and creativity of orientation, and nature of objectivity. [9]

### 3 Solution to the Problem

The solution to the problem consists of the Integrative Action and Process Model, which also complements and contributes to the other related and presented models.
The Integrative Process is the application that is used for best practices of Learning by Developing (LbD). Its object is the implementation and integration of the three statutory tasks of the Universities of Applied Sciences, in the context of services, service design, security and ICT studies at Laurea University of Applied Sciences.

The main contribution of Integrative Action and Process Model is the creation of linear development framework for cyclic innovation activities including quality perspective. The model itself is a liberation process for innovative activities, rather than a process for automatic innovation generation machine. The innovative learning cycles do not follow any fixed order and inside the innovation orientation the freedom of methods and creativity are emphasized. Hence, the Integrative Process is rather supporting than managing in nature.

In this case, the object is developing, helping and supporting construction for the birth of innovations and creativity. This process combines orientations changing and synthetic transformations in a systematic way. The Integrative Action and Process Model is illustrated in Fig. 3:

The Framework described in Trimming Process model includes five parts: (1) science and innovation (cyclic); (2) collector of objects (transform function); (3) development (linear); (4) result; and (5) quality (relevance). The implementation process starting point may be any of the parts, from (1) to (5).

The science and innovation part, (1), emphasizes creativity and it includes the elements that link research on future information technology [10] and new service generation together in solid way. The research ranges from the implementations of fundamental methods and new technologies to creation of novel applications and services and their action impact on people, region and society. It also includes:

1. the objectives of Service Design, that is the activity of planning and organizing people, infrastructure, communication and material components of a service, in order to improve its quality, the interaction between service provider and customers and the customer’s experience;

2. innovation, cyclic activities and elasticity for development objects, strategies and future programmes e.g. the programme of the ICT cluster of the Finnish Strategic Centres for Science, Technology and Innovation (ICT SHOK);

3. emphasizes cooperation in community of practices that is build around shared expertise or a new project that members of the community agree on and for which they jointly take responsibility for developing its future phases.

The Co-creative Collector of Objects, (2), represents function of linearization of objects to more like “boundary objects with flexibility” for development. There are many suitable and useful development and researching methods for cyclic to linear transformation and process realization. First useful example is the Progressive Inquiry model (PI model). The PI model describes the elements of expert-like knowledge practices in a form of a cyclic inquiry process producing synthetics and defined results [5].

The linear Development part, (3), refers to development methods and co-operation in communities of networked expertise. From the learning perspective, it means expertise that arises from social interaction, knowledge and competence sharing, researching and problem solving of collective and specified objects. The development part emphasizes cooperation and creating a ‘learning and developing’ culture and makes it possible to include and use various scientific perspectives and methods of learning by developing and researching in operation and action. There are tens of development methods available and suitable for process realization. One example of implemented cases is Rational Unified Process (RUP). The RUP model’s aim is to contribute to the building of resilient systems that can grow and adapt with new needs.

The process Results part, (4), are presented from the perspectives of the three tasks of the Universities of Applied Sciences, namely: (1) education; (2) research and development; and (3) regional and societal development. The results also have increasing effects on globalization, and for this reason, global impacts are included in results of the process. Regional development task creates
possibilities for value and knowledge transfer to innovations, new services, improvement of productivity, new business and livinglab environment linked to global markets, vitality of network, safety improvements, welfare and increased global impacts.

The model represents Quality management, (5), at national and global level. The Integrative Process manages the innovation and execution process, and it makes it possible to use feedback operations. The results are of course useful past to the implementation of new or next studies. The project carried out in the learning environments allows constructive development of context and learning. The cyclic part of the inception and elaboration phases is then continued with linear implementation process. This typically includes the implementation of learning and developing methods, integration of culture depending factors and running the environment.

4 Conclusion

The main contribution of the Integrative Action and Process Model is the realization of linear development framework that also supports cyclic innovation activities.

The Integrative Action and Process Model clarifies the implementation structures of the three statutory tasks of (1) education, (2) research and development, and (3) regional development from the learning perspectives of (1) knowledge-acquisition, (2) participation and (3) knowledge creation.

The acquisition perspective is implemented in the model’s learning process through the different aspects of the associated dynamic and elastic activities. The Changing of Objectivity Model illustrates the idea of synthetic transformation and the proposed model is supporting its construction in practice. The synthetic transformation is achieved through the trilogy, namely: (1) valuable objects; (2) value creation; and (3) action in value network. The model’s action is based on shared context and knowledge sharing which has meaningful link to elastic value-based objectivity and individual’s creativity and motivation. In generally, the motivation for knowledge acquisition is connected to meaningful, latest and up to date knowledge.

From the participation perspective, the process starting point may be shared object or object of innovation system which generates interest and possibilities for creativity in individual inside the enriching community.

From the knowledge creation perspective, the model’s synthetic transformation process continues through shared objects by using freedom within framework principle where inside participants owns development and make decisions on “how to” questions and future premises.

The Integrative Action model’s target is to be supporting construction for creativity and innovations. It contributes to improving the possibilities for inspiration, interest and creativity. It creates environments where the “valuable output results are not well known beforehand” and the “innovation results are evaluated but not formalized in advance”.

References: