Integrative Learning Environments in Perspective of Globalization Models and Effects in Higher Education

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Abstract:

Laurea’s strategic aim is to be a fully authorised and recognized International University of Applied Sciences participating in innovative activities. As a competence focused but small economy in the middle of globalisation trends, Finland is increasingly dependent on international R&D expertise in the reinforcement of its innovative capacity. The constructive research question addressed in this study is: What are the constructions and models contributing to International and Global activities that are used in the implementation and actualization of the University of Applied Sciences’ three statutory tasks of education, research and development, and regional development? The new proposition includes Integrative Process model in Perspective of Effects and the Meta-model of Elastic or Resilient Objects as well as model of Objectivity Changing. The theoretical background consists of the Learning by Developing (LbD) concept. The proposed models are applied and tested in Higher Education studies.

1 Introduction

Finland is at the top level of innovative culture and performance. The European Innovation Scoreboard (2007) ranks Finland third out of the 27 EU countries and third out of 37 countries (including the 27 EU countries, Croatia, Turkey, Iceland, Norway, Switzerland, Japan, the US, Australia, Canada and Israel), after Switzerland and Sweden respectively. The main reason for this is the high level of education and the strong cooperation and networking between the public and the academic and research sectors. Helsinki is the capital of a high tech country which has strong technological know-how, especially in information and communication technologies. The Helsinki metropolitan region consisting of Helsinki, Espoo and Vantaa, has 1.24 million inhabitants and is developing itself to a future “hub city”. Hub Cities are nodes in cross-border networks and attract business firms, investors and tourists. Interaction with other countries is always essential for a small nation like Finland with 5.5 million inhabitants. International business and research communities are expanding and Finland has to increase activity in internationalization of innovation.

It is evident that University of Applied Sciences has value from the regional and international development perspective. According to Fränti & Pirinen (2005), an Integrative Learning Environment’s roles in the innovation system of its area of operation is related to the existence of a network, its active and systematic participation in that network while executing its three statutory tasks in the same environment. University of Applied Sciences promotes the transformation of regional cooperation networks into innovators by transmitting and
producing new knowledge, competence and innovations in the national and international innovation system. [6]

Fränti & Pirinen (2005) continue that regional development and globalization has become the starting point for development and that the regional development task enriches learning. The learners’ predictive investigation of competences and technologies needed in their sectors at the early stages of their studies puts a positive, proactive pressure on the learning environments and on the contents of the academic syllabi. This proactive pressure is also an effective management and leadership skills development method as learners “learn to demand” the application of new knowledge and the learning of future core competences in courses. The influence on the sector and on regional development comes from the nature of the work. The practical R&D in the integrative learning environment is defined from the perspective of the nature of working life, with valuable results realized. Clearly, the nature of work at Universities of Applied Sciences is development-oriented. [6]

2 Research Method

The subject of this study is to create new model and practice for more effective Globalization of Integrative Learning Environment, and so it is obvious to use the design-science and constructive research approach [10]. In this study, the following concepts of constructive research are applied: (1) creation and execution of models, and; (2) evaluation of experimental implementation. The design-science research and constructive development and analysis work integrating the globalization perspective have been done during 2001 to 2008 at Laurea University of Applied Sciences unit in Espoo in close cooperation with the Helsinki metropolitan area. The study result is based on collected best practices and empirical data which are collected at Laura. Laurea conducts continuous action research of its own processes and it has several online databases and data collected are used for research and development purposes.

3 Related Work


3.1 Learning by Developing (LbD)

Pirinen & Fränti (2007) proposed the Learning by Developing (LbD) pedagogical and communal approach in which learning is linked to applied research, development projects and culture. This means learning expertise that arises from social interaction, knowledge and competence sharing, researching and problem solving. The model emphasizes on cooperation and the creation of 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 learning process starts with the identification of the initial problem or research objective, analyzing and describing it, and selecting appropriate work methods. Work consists of a continuous problem-solving process focusing on research, development and generating new competences. The result is a new creation, a new operating method, a model, a service or a product. [11]

Hakkarainen et al. (2004) stated that learning is constructed out of three perspectives. The first perspective is a metaphor for acquisition, conceptualizing learning as a process of
transferring knowledge to an individual learner. The second perspective is a metaphor for participation, which emphasizes the role of social communities in learning and professional development. The third perspective is a metaphor for knowledge creation, whose aim is the purposeful generation of information and the development of related social customs. [8] Figure 1 shows the three learning perspectives:


3.2 The Onion Model

Fränti & Pirinen (2005) presented the Onion - or the cooperation model for the integration of LbD, regional development work as well as international cooperation and globalization. Laurea’s operations are steered by its strategic intent, which is to be a fully authorized and international University of Applied Sciences participating in innovative 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. [6]

Laurea is an active player in regional development where 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 in promoting its internationalization. For learners, Onion model means increased opportunities and increased international interaction
in their studies. Laurea’s learners are equal participants in the integrative learning environment development group, which also include lecturers, partners and researchers. Figure 2 presents the Onion model’s terms. Clusters based development, cooperation, value network and international environments are the core set of terms in the implemented Onion model. [12]

In the Onion model, the network of integrative learning environments creates an enriching community of knowledge and practice. Innovative 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 favourable conditions for the birth of innovation. Laurea’s strategic choice is to integrate its three main statutory tasks into one another. The regional and global development strategy is one of the three main strategies used to steer operations. Steering takes place in accordance with Laurea’s management system and the strategic implementation plan. There is an increasing need for complementary development and operation methods in which the role of integrative learning environment as specified matches the development in the employment sector, its employees, and the reinforcement of adult education. Complementary developing indicates that the learning environment is an equal participant in and is equally responsible for development projects and their associated economic implications. Integrative Learning Environments (LE and LL) and Learning by Developing (LbD) model encompasses several kinds of innovation spaces and environments which emphasizes the transformation and integration of linear and cyclic orientations.

### 3.3 Global Development Models
Henry Etzkowitz and Loet Leydesdorff (1998) proposed the Triple Helix model to study the social conditions of knowledge production. The emphasis is usually put on the innovations produced through the dynamics of interactions and communications among academia, industry and government and on the social mechanisms of selection, variation and retention responsible for their evolution as sectors. Different versions of triple helix model are discussed in their structures and functions to promote or obstruct innovations in themselves or as product of their coordination [4]. Left side of Figure 2 illustrates the Triple Helix model.

Tarkkanen (2004) concluded that Laurea University of Applied Sciences is developing part of triple helix in the Helsinki metropolitan region and it is therefore positioned to serve the future needs of supporting both the regional and global development. Its task is to jointly create with other universities an educational system that enables the recruitment of notable foreign researchers and learners for long-term work in Finland. The challenge for Laurea is to set up the model and its implementation for high education in order to provide global possibilities for foreign researchers and learners. Laurea’s regional development model is presented in Figure 2. The success of the area, Helsinki Capital Area, has been explained using the Triple Helix model, i.e. the three-sided cooperation between the public sector (State), businesses (Industry) and higher education institutions (Academia). In order to improve its effectiveness, Laura has further developed the Triple Helix model to respond to the new innovation challenges of the metropolitan area with social and process-based innovations, business operations expertise and the use of ICT in service-intensive operations. [14]

In the metropolitan area, Laurea’s role is to act as a University of Applied Sciences that promotes metropolitan integration and globalization. In this area with its multiple players, Laurea’s strategic choice is to consciously participate in development programmes which bring various players together. Laurea participates in all the numerous programmes in its area of operation related to centers of expertise and regional centres, such as the International Service Design Network, Strategic Centre of Science (SHOK) and European Network of Living Labs. Laurea’s operations are at the daily reach of businesses. And as a major innovation system operator, it improves the innovativeness of its own organization, products and processes. Simultaneously, it operates in collaboration with public sector bodies, businesses and universities on innovation work.

### 3.4 Value Network Model

In Finland, the major innovation system operators are located in the Helsinki metropolitan area, so Laurea’s regional role centres particularly on its ability to network and share information and competence among various regional centres and players.

The case of Laurea’s Participant Driving Model implementation in the Helsinki metropolitan area points to the fact that the mechanical three-way cooperation and interaction among the parties will transform into a system in which the three parties are merged together in an Integrated Triple Helix. Integration creates an enriching community of knowledge and action, common and complementary cooperative services and value transfer. The new proposition is that specific part of the value network which generates elastic possibilities as objects. Elasticity is needed to allow for innovation creation, value based motivation, spirit and flow in cyclic innovation process. It integrates cyclic innovation based Living Labs Model with the linear trust-based Onion Model. Elasticity is a crucial term in innovative orientation where incepted objects are rather elastic or resilient than specified, or defined.
Pirinen (2008) proposed the Value Network Model where participant's interests and motivation is based on values, that is what value is to be gained from network and what value to be given back to a cooperative network. This "participants driven network model" or "participants value relation to the network" is called Value Network. The other case is Network with Value or Regional Value Network which should be of potential value to the people and citizens regardless of their personal participation, cooperation or relationship with the network. [12] Figure 3 presents value base quartet, Value Network bases and Value Transfer arrows:

![Value Networks Diagram](image)

**3.5 Elastic Objectivity**

Pirinen (2008) also proposed Elastic Objectivity which is especially desirable whenever the approach is innovation based. Its one advantage is that it makes tripartite interaction almost “available on demand” in the development work of innovation generation. If the target of the process is to make and generate innovations then the objects should also be flexible so that free, resilient changes and modifications are accommodated. Elastic object is a participant in the tripartite relationship (involving elastic object, actor and value network). It includes elastic ability to share information about design, spirit and tacit knowledge at the inception and elaboration phases of development process. Elastic objectivity means more elastic design, information sharing and communication in the communities of practices as well as knowledge creation in case of dynamic objects. In the Elastic Objectivity model the relations are based on interests; it amplifies the social network based on human communities, trust and participants’ human capabilities. Distributed expertise and dynamic cognition are the driving forces of objects value creation. This instance is also one phenomenon of paradigm shift of the reactive education methods on culture and space of proactive knowledge creation by researching, developing and learning [12]. Figure 4 summarizes Elastic Objectivity in the case of regional and global development:
In terms of innovation, the Onion model implementation strengthens the innovation capacity of its area of operation and creates favourable conditions for the birth of innovation. In practical cases, the innovation entities are elastic (in case of service design and semiotics: the study of signs and symbols) and resilient (in case of applied ICT) objects which transfers ideas, objects of issues and agendas to learning by developing context and processes [12].

People’s motivation, spirit, flow, trust and commitments are emphasized in innovation generation work and the idea of elastic objectivity is that it keeps innovation possibilities and spaces open and up to date with the knowledge of the participants. The used abstract word “spaces” points to the Integrative Learning Environments where innovations arise from individuals and their interaction. From an “enriching community” is mined the interaction relationships that link innovative individuals to one another and to their region [12].

4 Proposed Models

In this study, the new proposition includes Integrative Process Model in Perspective of Regional and Global Effects and the Meta-model of Elastic or Resilient Objects as well as Changing of Objectivity model. The models are implemented and tested in Laurea using master studies in Services, Service Design, Security and ICT. The propositions’ creation is based on design-science research approach including the building process, evaluation of construction results and action research approaches. [10]

4.1 Integrative Process in Perspective of Global effects

Integrative Process model and its implementations are described and collected in trimming process model. The outcomes of the process have regional, societal and global effects. All process phases are numbered from 1 to 11 in the “effect machine”. At the implementation
level, the first positive outcome is the favourable conditions for competence development created by elastic objectivity (6). The Integrative Learning Environment manages innovation and its execution process (7) and it makes it possible to use feedback operations from the outcomes (10 and 11) as inputs (1-4) and the steering and tuning of elastic or resilient objects. The outcomes of courses (8 and 9) are useful part to the implementation of next studies. The project carried out in the learning environments allows constructive development (7) of contents and learning. The cyclic development of resilient object in elaboration process (1-6) is then continued with linear implementation process which typically includes the implementation of learning and developing methods, the integration of culture, and the running and implementation of construction like Onion model (7). Integrative Process model is as illustrated in Figure 5.

![Figure 5: Pirinen, R. 2008, Integrative Process in Perspective of Global Effects](image)

There are tens of development methods available and suitable for the process realization part (7), the first useful example is Progressive Inquiry model (PI model). The PI model describes the elements of expert-like knowledge practices in the form of a cyclic inquiry process, this model is especially useful in the collector of elastic objects (5) phase [7]. The second implemented case (7) is the Rational Unified Process (RUP). The RUP aims to contribute to the building of resilient systems that are scalable and adaptable to new needs. RUP is suitable for realization development: from resilient objects to defined objects and from continuing development process work to realizations and executions of new products or services [9]. The third implemented method is the waterfall model. It is old, well known and still suitable, because it is effective and its distributed expertise, especially shared knowledge is included in all the phases of the development process. The origin of the term "waterfall" is often attributed to Winston W. Royce [3].

Regional, societal and global effects (8 and 9) are new knowledge which is augmented in Value Network model. The value and prospects associated with competitiveness underscores the importance of knowledge transfer and the its ability to enhance innovations, new services,
improvements of productivity, new business linked to global markets, vitality of network, safety, welfare and increased internationalization. The little red arrows illustrate execution and knowledge transfer process from local to global level.

### 4.2 Meta-model of Elastic or Resilient Objects

In the Elastic Objectivity model the elastic or resilient objects do not need to be formally very sophisticated, the idea is that the objects are interesting and really motivating to the participants. The framework of Elastic Objectivity is designed to facilitate engagement through the building of motivation and trust in the participants. It is necessary that participant’s competence and own key values and identity supports object’s interest. This means that the participant should have deep motivation for development work. The starting point of the development project is often the joint creation of ideas and the finding of more contexts linked to the innovating objectivity. Trust is crucial to building relationship among network participants. If a participant does not have adequate personal motivate object for innovating then Strategic Centre of Science (SHOK), European Network of Living Labs and other innovation idea factories produces briefly discussed objects for such new active developers. Elasticity and resiliency of objects is especially needed in “Innovation Circle” which is an inspirational and cyclic process where spirit and flow play crucial role. It is essential that the participants agree that the modified object is sufficiently innovative, motivating and worth a personal commitment for developing. This represents the perspiration and linear part of innovating process. The Meta-model of Elastic or Resilient Objects is as illustrated in Figure 6:

![Meta-model of Elastic or Resilient Objects](image)

Figure 6: Pirinen, R. 2008, Meta-model of Elastic or Resilient Objects

At the "elastic objectivity level", idea, issue, agenda, object and elasticity amplifies innovation process. Issues and agendas include object candidates, but an essential aspect of innovation process is for the participants to generate their own instances of the object to guide
innovation. This is because without the participants actively generating ideas, there can not be adequate motivation in the process. The elastic objectivity is a “flexible interface” and “knowledge transfer enabler” rather than a ready supported construction of the commissioned project. The starting points are often evolutionary artifacts by the cooperating participants of the value network integrated together by the professional developers from the research and development organizations. At the Societal level, Strategic Research Objects are also carried out in a Strategic Research Agenda (SRA). In that flexible and innovation enabling way, the Elastic objectivity makes and binds the path to innovation and development process from individuals’ key competence to Globalization possibilities.

### 4.3 Changing of Objectivity Model

Nature of objectivity changes depending on the perspective of orientation. In the model based orientation only few innovations exist. In the problem base orientation basic idea and development objects are usually well known and defined. The traditional research questions and objectives are usually formulated and fixed. Elastic Objectivity is desirable where the approach is innovation based and flexibility and resiliency of development objects are needed to generate more motivation, spirit and flow as well as innovation power in a cyclic innovation process. In the innovative orientation, the incepted objects are like modelling clay, flexible, dynamic or resilient rather than specified, defined or formal. Changing of objectivity is illustrated in Figure 7.

![Changing of Objectivity Model](image)

The development orientation and its implementation process integrate cyclic innovation process with more constant and linear development process and so, in this case the changing direction is from cyclic to linear. The model describes the necessity of different orientations, showing that all the orientations are important and needed. From another perspective, the figure presents new competence development where the 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. This changing objectivity also have crucial role in organisational management and leadership culture. The presented models are one possibility and an example of the applied innovation leadership model where enabling, participation, authenticity, creativity, innovation space and community of expertise are emphasized.

5 Cases and Implementation

The implemented cases in Bachelor degree level of Higher Education were in Hospitality Management, Security and ICT involving 1120 students and those for Master degrees were in Service Management and ICT involving 56 students.

The strategic important objects are collaborative development of Service Innovations and new competences in Service Design. Laurea operates as an associate member of the International Service Design Network which activates the development of new services for public sectors and companies, arranges various business events, researches and develops innovation networks as well as researching challenges faced by various actors in the course of developing new services (www.service-design-network.org).

The Laurea Living Labs (LLL) is a member of the European Network of Living Labs (ENoLL). ENoLL establishes a Europe-wide platform for providing user driven innovation capabilities and services to small and medium size enterprises, international corporations, public sector agencies, academic institutions and individual citizens. The Laurea LLL is an approach to stimulating and accelerating industrial and societal innovation. It is also a way to connect and empower the users to participate in research, development and innovation (http://www.cdt.ltu.se/~zcorelabs).

LaureaLabs in 2006 developed an international expertise cooperation network of international developers and researchers to facilitate knowledge transfer and ultimately to enable regional development. The cooperation actively includes international trainees who contribute to regional development by generating services and research data in different fields of expertise. It also includes applied R&D projects that contributes innovative and creative solutions to specific problems and needs in companies and industries operating in rapidly changing, knowledge intensive fields.

6 Experimental Evaluation, Conclusion and Future Work

The Higher Education institutions can promote knowledge transfer through their international operations. This makes the greater Helsinki Metropolitan Area a genuinely international and multicultural innovation environment that has strong functional links to other top innovation regions in the world and strategic alliances with other top universities in the world. The region endeavours to form an international community, through the setting up of internationally attractive and innovative LbD-based R&D projects and the institutionalization of effective operating models for innovation. Learners at all levels of higher education are usually seeking ways to improve on their research and acquire new competences hence, international value network gives them new concrete prospects and possibilities to continue their studies in global perspective.

Universities of Applied Sciences have huge potential and realistic possibilities to implement its statutory regional development task and other real societal and global challenges. The paradigm shift on education from the traditional methods to that based on knowledge creation through researching, developing and learning is fast growing. The challenge however involves
changing the institutional systems, its roles, and more importantly the attitudes of the teachers, the students and other participants to meet the paradigm shift.

National evaluations have recognised the innovative learning methods and future-oriented development at the integrative learning environments. For instance, Learning by Developing and internationalization work influenced Laurea’s appointment as a centre of excellence in regional development for 2003-2004 and 2006-2007, and as a centre of excellence in education for 2005-2006. [13]

Vyakarnam et al. (2008) identified strengths and challenges from learners’ perspective. The strengths identified includes great employability, effective participation in real development projects, learners as the centre of development work, highly experimental learning, raised aspiration, social skills, self confidence, personal responsibility for results, contact with companies and organizations and finally, coaching learners rather than managing study events. The challenges includes system relies hugely on group commitment, motivation and coaching, how to reach elastic objects and new up-to-date knowledge (last known context) in a more systematic way, “learning themselves” taking much longer time than coaching or is this inevitable in learning of real development and, deciding the optimum ratio of direct inputs and elasticity objectivity and initiatives. [15]

Although formal research, especially research results and relevant problems are good starting points of innovating process, more elastic objectivity, global thinking as well as transformation from reactive to proactive direction is needed. New innovations could be born not necessarily out of research or even relevant problems but out of inspiration and perspiration. Inspiration and perspiration are always needed and must be present before innovation can be introduced to the global markets.

In conclusion, there are three terms, namely: elastic objectivity; multidimensional transformation; and space with spirit and flow present in the innovation orientation. Different kind of methods clearly helps and contributes to the area of linear orientations, but there is no formal solution at the same time for random and cyclic innovation processes. Therefore, freedom of methods, applications, objectivities, spirit, flow, transformations and trust exists in the world of cyclic innovation orientation which also includes learning.

References


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