

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

July 10th - 13th, 2009 ~ Orlando, Florida, USA

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ABSTRACT

In the case of higher education, what kinds of constructions and models contribute international and global activities that make up and implement the three tasks of a Finnish university of applied sciences: education, research and development, and regional development? The cases studied in higher education were set in services, service design, security and ICT, and were performed at Laurea University of Applied Sciences between 2001 and 2009. Laurea's strategic aim is to be a fully authorized and international university of applied sciences participating in innovation activities. As a competence-focused but small economy undergoing globalization-oriented development, Finland is increasingly dependent on international R&D expertise and the reinforcement of its innovation capacity. Universities of applied sciences constructively form a new and increasingly important factor in the Finnish innovation system. It is essential for the Finnish innovation environment, especially in the Helsinki metropolitan area that universities of applied sciences be increasingly active in international research programs and networks. This study's proposition includes: dimensions of action, integration of elements and implementation of integrative process model in the perspective of regional and global effects. The theoretical background consists of the Learning by Developing (LbD) concept.

Keywords: Globalization, Internationalization, Regional Development, Value Networks, Triple Helix

1. INTRODUCTION

Finland is at the forefront of innovative culture and performance. In an analysis of innovation performance, [1] Finland was ranked third out of the 27 EU member states, and third out of 37 countries (including the EU countries, Croatia, Turkey, Iceland, Norway, Switzerland, Japan, the US, Australia, Canada and Israel), after Switzerland and Sweden. 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 technical know-

how, especially in information and communication technology. The Helsinki metropolitan area, consisting of Helsinki, Espoo, and Vantaa, has 1.24 million inhabitants and is developing into a "hub city". Hub cities are nodes in cross-border networks, which attract businesses, investors and tourists. Interaction with other countries is always essential for a small nation like Finland (with a population of 5.5 million). International business and research communities are expanding and Finland has to increase its efforts in internationalizing its innovations.

This study's focus is on the processes and local and global effects of integrative action, and their development in the everyday operations of universities of applied sciences [1]. The implementation of the integrative process points to the transformative full duplex usage of cyclic innovation activities [2] and linear development orientations with quality and relevance as the perspectives of action, where learning is briefly approached through three metaphors of learning: (1) knowledge acquisition, (2) participation, and (3) knowledge creation [3]. Figure 1 illustrates Integrative learning.

Learning in Integrative Action (three implemented perspectives)

Knowledge Acquisition (1)	Participation (2)	Knowledge Creation (3)
knowledge transfer	knowledge-sharing	new knowledge creation
process of learning within individual's mind	social activities and practices as bases for learning	new knowledge objects and activities are collaboratively created
based on constructivism	based on socio-constructivism	freedom of methods and support for creativity
process-based	progressive	creative
co-instructive	co-operative	co-constructive
reactive	active	proactive
Element of Processing Nature	Element of Knowledge Sharing Community	Element of Knowledge and Innovation Community

Figure 1: The three metaphors or perspectives of learning are not mutually exclusive; all of them are necessary and important in integrative learning.

Each of the metaphors has its distinct focus, theoretical assumptions, and units of analysis. In this

applied case there are no clear-cut theoretical and methodological boundaries between these approaches. The three metaphors are not mutually exclusive; all of them are needed to successfully consider learning processes. These metaphors cannot be prioritized from weakest to strongest, because they answer different kinds of questions in order to explain the complexity of human cognition and nature. Figure 1 introduces the three perspectives of learning (applied in this implementation): learning as knowledge acquisition (the acquisition metaphor); learning as participation in a social community (the participation metaphor); and learning (and intellectual activity in general) as knowledge creation (the knowledge-creation metaphor). The focus is on investigating mediated processes of knowledge creation that have become especially important in a knowledge society [3, 4].

2. RESEARCH METHOD

The purpose of this study was to create a new model and practice for more effective globalization in integrative learning. Therefore, it is obvious to use the Design Research (DR) approach [5]. In this study, the following concepts of constructive research are applied: (1) creation and execution of models, and (2) evaluation of experimental implementation. This constructive development and analysis work was conducted from 2001 to 2009 at Laurea University of Applied Sciences in Espoo, and in cooperation with the Helsinki metropolitan area, including the globalization perspective. The study's results are based on collected best practices and empirical data from Laura. Laurea performs continuous "participatory and sustainable" action research (AR) on its own processes and it has several online databases and data collection procedures for research and development purposes.

3. RELATED WORK

Previous propositions and theoretical background: Learning by Developing (LbD) pedagogical approach (2007); Onion Model (2004 and 2008); and Value Network Model (2004 and 2008).

3.1 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, research and problem solving on collective objects. The model emphasizes cooperation and creating a "learning and developing" culture; it 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 by identifying the initial scope or research object, analyzing and describing it, and selecting appropriate work methods. Work consists of a continuous problem-solving process, focusing on research, development and generating new competence. The end

result is a creation, a new operating method, a model, a service or a product [9].

Learning in the integrative application model is generally constructed out of three metaphors of learning [3]. The first (1) perspective is a metaphor for acquisition, conceptualizing learning as a process of transferring knowledge to an individual learner. 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 [8, 9]. Figure 2 presents three learning perspectives:

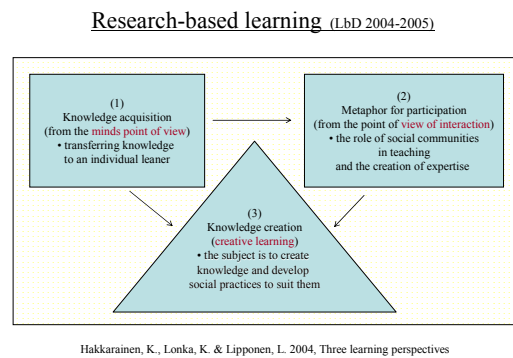


Figure 2: The three metaphors of learning were implemented in integrative action in 2004.

The background of the LbD learning part (L) is closely related to and pedagogically implemented in Engeström's concept of expansive learning [6], Hakkarainen's progressive inquiry model (PI model), underlined in [4], Bereiter's knowledge building approach and Bereiter's and Scardamalia's learning to work creatively with knowledge [7] and the communities of networked expertise approach of Hakkarainen et al. [4]. The innovation development approach (D) emphasizes aspects of social and service innovation creation and generation, service development and service design process implementations [9].

3.2 Elements of Integrative Action

Based on the three tasks, integrative action [2] builds bridges between technologies and applications so that research results can be turned into competence and economic success. Innovation alliances must be made between various stakeholders, particularly in science, business and politics. In the integrative action model, vertical cooperation – namely lead innovations – is geared toward certain services, applications and sectors with specifically coordinated support contributions from technological areas. In integrative cooperation, "technology alliances" pursuing technological objectives, are created jointly with science and business, together with service platforms.

This “lead innovation ecosystem” includes different types of cooperation, action and activities.

There are several reasons for a clearer specification of the elements of the general integrative action model. The first is the confusion in practical management. A completely different type of management is required for different actions. For example, if relevance-based action processes are managed in the same way as creativity and innovation actions, the result will be chaos; meanwhile, if creativity support is implemented as linear action, the outcome will be either very little innovation or no innovation at all. The second reason is the core idea behind “changing of objectivity” [8], which refers to the balancing of subjectivity and objectivity to support creativity. It explains how and in which parts of the process objectivity and subjectivity are used to support creativity. The third reason is that commercially beneficial innovation is impossible without radical interventions, so cyclic orientation is different from others. The fourth reason is the fact that we live in a time of globalization. While the population’s average age rises, the actual population is decreasing in size, which means that future business will focus more on creativity and innovation. The fifth reason is that good quality is important and it also differs between different actions, so the nature of the elements must be analyzed to lead to a quality system that takes creativity and innovation better into account. The sixth reason is that an application of pragmatic theory of knowledge and innovation-oriented activities require a different type of action and flexibility. A pragmatic situation differs from an innovation situation; a supporting structure for creativity operates better in the region of freedom of methods [2]. The seventh reason lies in emphasizing competence: action primarily bridges competences instead of knowledge, and knowledge bases are co-created in a shared domain of knowledge. Participatory action within an authentic situation and the existence of competence creation means using knowledge in action. Based on these reasons, a clearer definition is sorely needed in order to differentiate between and clarify different actions. In the case of integrative action the four elements are specified: 1) cyclic, for supporting creativity and innovations; 2) thematic, for co-creating lead innovations and a body of knowledge; 3) linear, for developing and implementing processes; and 4) relevance, for quality.

3.3 The Onion Model

The onion model, which is the cooperation model used for the integration of LbD, regional development as well as international cooperation and globalization, is described in Figure 3. In the case of Laurea, operations are steered by the school’s 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, being “fully authorized” refers to carrying out applied research and development work, and serving regional

development in accordance with the quality criteria set for European higher education.

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 while promoting its own internationalization. For students, the onion model means increased opportunities and increased international interaction in their studies. Laurea’s students are equal participants in the integrative learning environment development group, which also includes lecturers, partners and researchers. Figure 3 shows the onion model and its terms. Cluster-based development, cooperation, the components of the value network and international environments are the core terms in the implemented onion model.

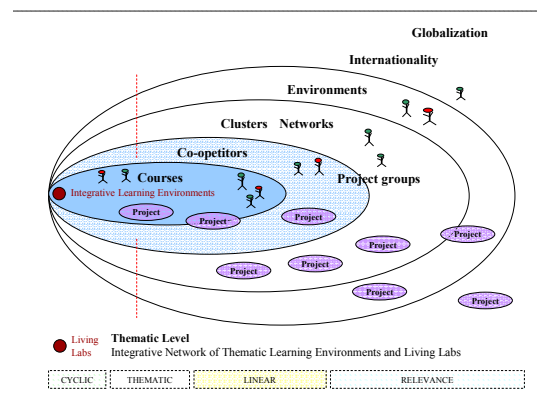


Figure 3: The Onion Model extends traditional and instructional learning to a culture of Learning by Developing. It is a construction of the paradigm shift from reactive education methods to a culture of proactive knowledge creation through research. Integrative action links Living Labs and institutional integrative learning environments on a thematic level.

3.4 Value Network Model

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

Experiences of the integrative model in the Helsinki metropolitan area point 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 [10]. This integration creates an enriching community of knowledge and action, common and complementary cooperative services and value transfer between the parts of the network. It generates possibilities, as objects that are needed to allow more innovation creation, value-based motivation, spirit and flow in the innovation process become available. It also integrates innovation-based Living Labs with the

trust-based onion model at the thematic level. The value network model clarifies motivation for integrative and collaborative work from the perspective of value, and connects the integrative action process to the value network using cyclic, thematic, and linear and relevance elements as perspectives.

A participant's interests and motivation are based on values. The value that can be gained from the network and the value that can be given back to the cooperation network are presented in [11]. This "participant driven network model" or "participants' value relation to the network" is called a value network in the case of integrative action. The value network is illustrated in Figure 4.

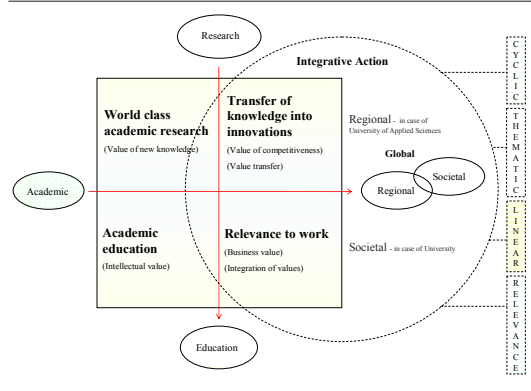


Figure 4: The Value Network Model focuses the transfer of value in action of network; one perspective is the creation of regional, national and global results and impacts.

The definition of a value network varies. In this integrative action case, a value network is an open set of social and technical participants. Value networks work together via relationships to create economic value, social or public goods. New services, product innovations, knowledge and creativity are emphasized in the case of integrative action. This value takes the form of cooperation, new knowledge and economical value from the participant's perspective.

Value networks exhibit interdependence, accounting for the overall worth of products and services. Companies typically have both internal and external value networks. Outward-facing networks include customers or recipients, intermediaries, stakeholders, complementary actors, open innovation networks and suppliers. Typically internal value networks focus on key activities, processes and relationships that cut across internal boundaries, such as order fulfillment, innovation, lead processing, or customer support. Value is created through exchange and the relationships between roles and transformations [11].

4. PROPOSITION

This study's proposition includes: dimensions of action, integration of elements and implementation of integrative process model in the perspective of

regional and global effects. The general model of integrative action is evolved out of empirical cases of integrative action between 2004 and 2009. The models were implemented in higher education studies in services, service design, security and ICT.

4.1 General Models of Integrative Action

The general integrative action process is an application used in the best practices of LbD [2]. The objective was to integrate the three statutory tasks in the context of services, service design, security and ICT in the case of Laurea University of Applied Sciences. The integrative action process is illustrated in Figure 5. The colors represent the different elements – cyclic, thematic, and linear and relevance; these elements join all the integrative models together.

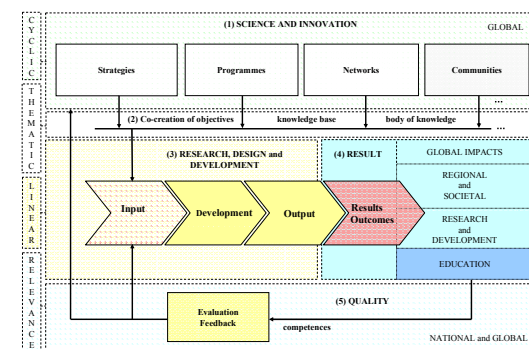


Figure 5: This general model of integrative action includes the elements and general functions and terms of integrative action.

Empirical practice, e.g. [13], and literature, e.g. [4], have shown that in order to develop expertise of a pragmatic situation, students and other participants must integrate a body of knowledge (thematic element) with knowledge understanding and action within authentic situations (linear element). The existence of competence creation (relevance element) means using knowledge in action. Based firstly on the pragmatic theory of knowledge and secondly on cyclic action (where learning is briefly approached through three metaphors of learning: (1) knowledge acquisition; (2) participation; and (3) knowledge creation [3, 4]), integrative action is used to bind knowledge and competence to the co-creative process in a situation where international cooperation, transformations and collaborations are executed [12].

Integrative action [2] builds bridges between technologies and applications, so that research results can be turned into economic success. Innovation alliances must be made between the various stakeholders, particularly in science, business and politics. In the integrative action model, vertical cooperation is geared toward certain services, applications and sectors with specifically coordinated support contributions from technology areas. Individual priorities and projects compete with each

other and funds are allocated to those priorities and projects that hold the greatest promise for the set objectives. In this way, new technological priorities are defined and existing priorities revised over the duration of the framework program. A dimensional model of integrative action is illustrated in Figure 7.

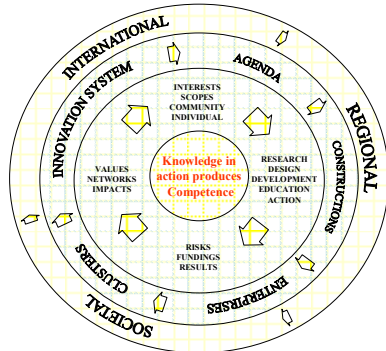


Figure 7: This dimensional model of integrative action illustrates components and terms that are used in the general integrative action process.

The term “authentic” applied in LbD means that all transactions and implementations of learning situations are simultaneously connected to real development cases of the world of work, with true value in the value network.

4.2 Applied Integrative Process in the Perspective of Global Effects

The applied integrative process model and its implementations are described and collected in the trimming process model. The outcomes of the process are regional, societal and global effects. All process phases are numbered from (1) to (11) in the “effect machine”. The integrative process model is illustrated in Figure 5.

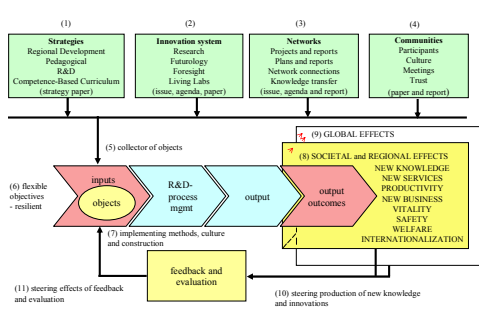


Figure 5: An applied model of integrative action joins the Finnish innovation system to globalization using transformations, design and action research.

At the implementations’ operative level, the first positive outcome is the favorable conditions for competence development created by objectives (6). The integrative learning environment manages the

innovation and execution process (7) and it makes it possible to use feedback operations from outcomes (10 and 11) to inputs (1-4) and steering and tuning of flexible and resilient objects. The outcomes of courses (8 and 9) are useful past the implementation of the next studies. The project carried out in the learning environments allows constructive development (7) of contents and learning. The cyclic development of object in the “sketching and elaboration” process (1-6) is then continued with a linear implementation process which typically includes the implementation of learning and developing methods, integration of culturally dependent things and a running and implemented construction like the onion model (7). Regional, societal and global effects (8 and 9) are the results: new knowledge; the value of competitiveness and its prospects gives possibilities for value transfer and the ability to transfer knowledge to innovations; new services; improved productivity; new business linked to global markets; vitality of the network; safety; welfare; and increased internationalization.

5. IMPLEMENTATION

The cases implemented at the Bachelor level of higher education took place in hospitality management, security and ICT, involving 1,120 students. At the Master level, they were in service management and ICT, involving 56 students.

The strategically important objects are the collaborative development of service innovations and new competences in service design. Laurea operates as an associate member in the International Service Design Network, which activates the development of new services for the public sector and business, arranging various business events, researching and developing innovation networks and tackling research challenges faced by various actors in relation to developing new services. (www.service-design-network.org)

Laurea Living Labs (LLL) is a member in the European Network of Living Labs (ENoLL) which has established a Europe-wide platform providing innovation capabilities for user-driven co-creative innovation processes for small and medium-sized enterprises and international corporations, public sector agencies, academic institutions and individual citizens. LLL is an approach for stimulating and accelerating industrial and societal innovation and for connecting and empowering users to participate in R&D and innovation. (<http://www.cdt.ltu.se/~zcorelabs>)

The cases included international expertise cooperation developed in 2006 by LaureaLabs, which facilitates and enables regional development and knowledge transfer through international developers and researchers. The cooperation consists of international trainees who contribute in regional development by generating services and research data in different fields of expertise included applied R&D projects

contributing innovative and creative solutions to specific objects in companies and industries.

6. EXPERIMENTAL EVALUATION

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 the world's top innovation regions and strategic alliances with the world's top universities.

Students in higher education are satisfied with improvements of their own research and development competencies and the international value network gives them concrete prospects and possibilities for continuing their studies in the global perspective.

Feedback from industry: "This means cooperation with the employment sector to learn about the authentic developments and problems encountered at work"; "The method systematically seeks answers to problems whose solutions require new knowledge"; "The core of the model is formed by object-oriented work, which means that learning focuses on genuine development of the working life"; "Learning has a clear objective and takes place through the process of generating new competence"; "Improvements in social skills and self-confidence are clear"; "More learning is needed for balancing the enthusiasm of a new developer and the managed goals of a legacy organization".

Universities of applied sciences have huge potential and realistic possibilities to implement their statutory regional development task and other authentic societal and global challenges. The paradigm shift of education methods towards knowledge creation through research, development and learning is growing; one challenge, however, involves changes in the institutional systems and roles and attitudes of the students, teachers and participants.

Laurea's Learning by Developing (LbD) and internationalization efforts 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 and 2008-2009, all reports in [13].

As a conclusion, some strengths and challenges from the students' perspective. *Strengths*: great employment prospects, effective participation in authentic development projects, being at the center of development work, highly experimental learning, raised aspirations, social skills, self-confidence, personal responsibility for results, contact with companies and organizations, coaching rather than management through study events. *Challenges*: the system relies hugely on group commitment, motivation and coaching; "self-learning" takes much longer than coaching [14].

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