PEDAGOGICAL SYSTEMS THEORY AND MODEL FOR SUSTAINABLE HUMAN DEVELOPMENT IN EARLY CHILDHOOD EDUCATION AND CARE (ECEC)

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Abstract

The contexts are kindergarten teacher student education, early childhood education and the author's long term research process of constructing a new pedagogical systems theory. The two systems models, which the author created earlier, function now in a theoretical background. The models are different but both of them reflect on early childhood education and care (ECEC). The exact focused question is, what the interconnections of the two different models of ECEC are. Solutions will be shown by making a cross tabulation between these two qualitative models. The results will construct forward the new pedagogical systems theory of ECEC. This theory and a corresponding model can help teachers to become responsible mentors for sustainable development, especially for children's education for sustainable human development and well-being.

Key words: *early childhood education and care (ECEC); pedagogical systems theory; pedagogical systems model; sustainable human development.*

Introduction

The main long-term aim of the author has been to develop a new theory for early childhood education and care (ECEC). In this article, one detail of the mentioned theory will be resulted. The theoretical part consists of the explanations of the main concepts and the two models on early childhood education (ECE). After that the main problem, a methodological view, methods, results and discussion of the study are presented.

Theoretical background

About the main concepts

In European context the generally used concept is early childhood education and care (ECEC). "'Education' and 'care' are combined in the phrase to underline, that services for young children can combine care, developmental and learning opportunities" (European Commission, 2009, p. 7).

In the Finnish context, the accepted concept is *varhaiskasvatus* (literally translated *early education,* meaning is the same as *early childhood education*). This concept implies education under school age which means under seven years of age. In Finland, the concept *preschool* means only six year olds. In the Finnish context, it is not usual to add *care* (*hoito*) after *early childhood education* (*varhaiskasvatus*) – besides when the text is meant for European and international readers. It is thought that *care* belongs under and inside *early childhood education* (*varhaiskasvatus).* In the results of the author's studies (Härkönen, 2003a, 2008, 2009), many other concepts are at the same position as care, when speaking about their relations to the concept early childhood education. They are *education, teaching, learning* and *development,* even *socialization, civilization* and *spiritualization,* which are found in literature.

What does it mean when we speak about *sustainable early childhood education*? Jämsä (2006) has analyzed this thing very exactly. He tells that *sustain* means supporting and maintaining something, to hold up, giving a firm groundwork for something to hold it up permanently. In the concept sustainable, *-able* indicates that the function of stem is capable of being executed, executable. Jämsä (2006) continues that *educe* means bringing out, eliciting, developing or evolving, especially from a latent or potential state. Educe also means calling forth or bringing out (something latent, hidden, or unexpressed. Jämsä (2006, p. 14) says that "sustainable education is a new research subject".

The purposes of *sustainable education* can be promoting equity, improving our quality of life and well-being, sustaining our natural resources and protecting health. Jämsä (2006, p. 28) "underlines that sustainable education … is not separable from the general principles of education and … it is an essential part of ethical education". His conviction is "that personal ethical choices, the embodiment of the individual and social good, give a transcendent ground for ethical views in all education and sustainable education… Sustainable education tries to awaken people to a deep personal awareness of the different consequences of different moral choices".

About *sustainability* Jämsä (2006, p. 28) says that it is "usually confined to the survival of nature and the human action for or against it", and that "sustainable education stresses the human responsibility for the consequences of our misuse of natural sources". This is not enough in his views. "The risk from inside our species should be in the focus of our attention, as well." "Sustainable education necessarily needs a general view of moral education as well."

The new pedagogical systems theory is based on historical educational ideas. Cohen and Manion (1994, p. 46) writes, that *"the historical study of an educational idea or institution can do much to help us understand how our present educational system has come about; and this kind of understanding can in turn help to establish a sound basis for further progress. Historical research in education can also show how and why educational theories and practices developed. It enables educationalists to use former practices to evaluate newer, emerging ones".*

The new pedagogical systems theory is going to consist of *pedagogical* views. It will deal with philosophical, educational and pedagogical values, aims, goals, subjects, methods. It will show links to different sciences and knowledge areas and it will also show how different curriculums and programs can well be planned and evaluated (Figure 1). These kinds of phenomena have been and are pedagogical by their nature (Gudjons, 2003; Helenius & Korhonen, 2008).

The *systems theory* means (Heylighen & Joslyn, 1992, pp. 1-2) "the transdisciplinary study of the abstract organization of phenomena, independent of their substance, type, or spatial or temporal scale of existence. It investigates both the principles common to all complex entities … and the models which can be used to describe them." "Rather than reducing an entity … to the properties of its parts or elements … systems theory focuses on the arrangement of and relations between the parts which connect them into a whole (cf. holism)."

"A *system* is a dynamic and complex whole, interacting as a structured functional unit. Energy, material and information flow between the different elements that compose the system." "A holistic system is any set (group) in interdependent or temporally interacting parts. Parts are systems themselves and are composed of other parts, just as systems are generally parts or holons of other systems" (Wikipedia, 2009).

"*Systems thinking* is a powerful set of problem solving tools and techniques based on system analysis and design, that helps us avoid unintended consequences and find optimal solutions to complex problems." It is "a philosophy that looks at the world in terms of just what it says – systems. The entire world can be seen as one big system which encompasses countless smaller systems." "A systems thinking approach may help you break through and find more effective, more sustainable solutions" (Senge, 2009).

Rapoport (1968, pp. 452-453) says that the definition of systems should also consider the *language*, not only the physical systems. He writes (p. 453), that "social scientists speak of economic and political systems; philosophers, about systems of thought". "In the larger sense, a *language system* may also include the referential world and even the speakers." In accordance with Parsons (1968), the human action has its subsystems, among which one is a cultural system. It comprises the language, communication, beliefs and ideas. Chang-Gen (1990) divides real systems into categories like the natural systems, the social systems and the systems of thinking.

Thus, the concept of *early childhood education is a system,* too. It has many subsystems which have relationships with each other and with the whole entity.

The author has said that the pedagogical systems theory will be *a new theory* for early childhood education. *New* means just the characteristic features which systems thinking means. It is a quite different way of seeing than a common way of cause and effect thinking.

The above mentioned concepts like *care, education, teaching, learning, development, socialization, civilization* and *spiritualization* can be understood as goals and aims of education. At least in Finland, one concept of them is the thing, it is *learning.* But especially in approaches, originated from the developmental psychology, the *development of children* has seen as a central process in children's life course. Valsiner (2000) presents a cultural-historical theory of development, Bronfenbrenner (1989) has created the ecological systems theory of human development and in Vasta's (2002) book there are six theories about children's development. There are also many books where developmental theories are applied to the early childhood education and care (Bredekamp, 1987; Hakkarainen, 2002; Robinson, 2008; Wood, 2008). In each theory, the meaning is to give knowledge about a healthy human development process.

The concept *sustainable human development* has not been usually used in developmental theories. However, an application from the common concept sustainable development to sustainable human development has already been done. Sustainable human development is a new concept. Perhaps we must begin about sustainable education.

The general systems model of early childhood education thinking

The general systems model of early childhood education and preschool thinking (GSM of ECE) is depicted in Figure 1 as a result of a creation process by the author (Härkönen, 2003b, 2006, 2008, 2009).

Figure 1 reflects pedagogical thinking of historical education pedagogues like Froebel, Steiner, Montessori, Neill and Dewey. In the article *The new Systems Theory of Early Childhood Education and Preschool as a Frame of Reference for Sustainable Education* (Härkönen, 2003b, pp. 5-6), the systems character of the pedagogues' educational thinking was found and described exactly. The lines between the main context areas link them together in systems way.

It is extremely important to notice that the question is about the model of *thinking*. The word *views* which lies in every context areas (white ovals) is always written in the plural form. This means that the context areas consist of diversities of opinions, beliefs, interpretations and also diversities of different kinds of theories.
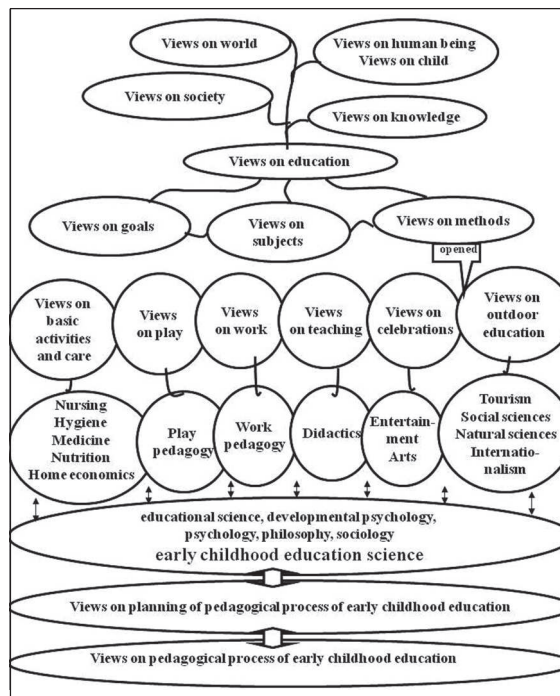

Figure 1. The general systems model of early childhood education and preschool thinking
           (GSM of ECE) (Härkönen Ulla 2008)

The model of the concept of early childhood education

The model entitled as *The four extensions and eight intensions of the early childhood education concept as a systems model* (Figure 2) is presented with brief comments. A text analysis and a concept analysis method were used in studying the Finnish early childhood education textbooks (Härkönen, 2003a, 2003b, 2006, 2008, 2009).
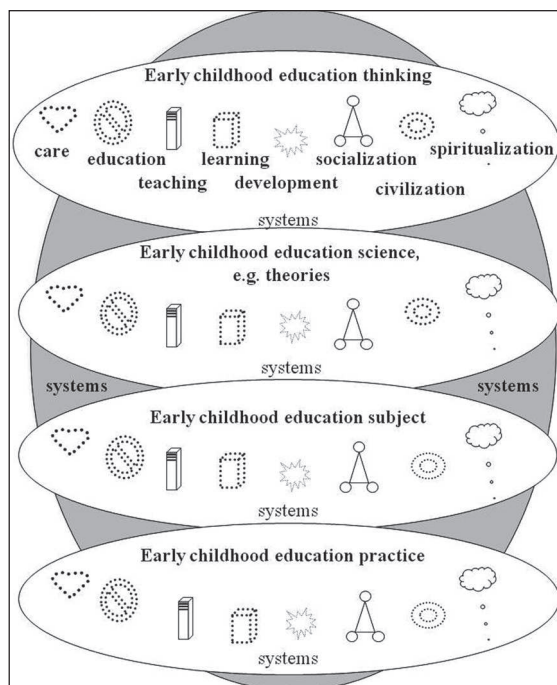
Figure 2. The four extensions and eight intensions of the early childhood education concept as a systems model (Härkönen Ulla 2008) (EECERA_08: spiritualization added)

The 'extension' means an application area of the concept. It must look at what phenomena in the world will suit the concept or fulfill the criteria given in the intension. The 'intension' or content means the criteria or a set of signs that is held valid for a given period of time (Karvonen, 2003).

Figure 2 shows that the concept of *early childhood education* comprises four extensions: *thinking, science, subject* and *practice* extensions. The intensions which make the mentioned extensions just as early childhood education are *care, education, teaching, learning, development, socialization, civilization* and *spiritualization*. Extensions are in systems relationships with each other, intensions are in systems relationships with each other. Extensions and intensions are in numerous relationships with each other.

Problems

After getting the mentioned models ready, the new question arose about the interconnections of them (Figure 1 & Figure 2). This study will answer the following question:

What are the interconnections of the mentioned two models: *The general systems model of early childhood education and preschool thinking (GSM of ECE)* (Figure 1) and *The four extensions and eight intensions of the early childhood education concept as a systems model* (Figure 2)?

Methodology and methods

Parsons (1968, p. 458) has said that "methodologically, one must distinguish a *theoretical system* which is a complex of assumptions, concepts and propositions having both logical integration and empirical reference, from an *empirical system*, which is a set of phenomena in the observable world that can be described and analyzed by means of a theoretical system". This means that that the theoretical systems model have also connections to the observable early childhood education.

In a *content analysis* the question is how to give a greater conceptual order to the specific data (Strauss, 1987, p. 143). *Relational analysis*, like *conceptual analysis*, begins with the act of identifying concepts present in a given text or set of texts. However, relational analysis seeks to go beyond presence by exploring the relationships between the concepts identified. Relational analysis has also been termed semantic analysis (Palmquist, Carley, & Dale, 1997).

I this study three different models are presented. "On the one hand, a *model* can be a representation of a selected part of the world (the 'target system'). Depending on the nature of the target, such models are either models of phenomena or models of data. On the other hand, a model can represent a theory in the sense that it interprets the laws and axioms of that theory" (Frigg & Hartman, 2006, p. 2.).

As a method, a *cross tabulation* between the two verbalized and modeled data, were made. Cross-tabulations are the powerful ways to combine qualitative coding with the more descriptive organization of data (Lewins & Silver, 2007). Many research problems are quite complicated, and working out graphic means for helping to understand them requires innovative imagery and careful consideration (Strauss, 1987).

Results

Figure 1 bears the validity of historically sustained features of pedagogical thinking over three hundred years in Europe and in the rest of the world; Figure 2 was constituted on the basis of the definitions of the concept of early childhood education analyzed from Finnish text books on early childhood education and preschool which cover about a period of thirty to forty years just in one country. The model 1 has a stronger historical sustainable tenability and legitimacy.

In both cases, textual data was analyzed by a content analysis. Both resultant models are qualitative descriptive models. The analysis of the native literature may be more credible than the literature of different ages and in languages. However, the author has tested both models in several contexts and they both seem to be credible.

Now in this study these models were cross-tabulated. The results are seen in Figure 3 entitled *Pedagogical systems theory and its core value contexts, presented as a systems model*. The content of Figure 1 is marked with blue (or black and thick in colourless printing) rimmed oblong areas which consist of the parts and the whole of the *General systems model of early childhood education and preschool thinking*.

It must be noticed that Figure 1 reveals only about one extension; it must be early childhood science (because this area consists, for instance, of theories). The result is that Figure 1 shows new and versatile intensions for the extension of early childhood education science.
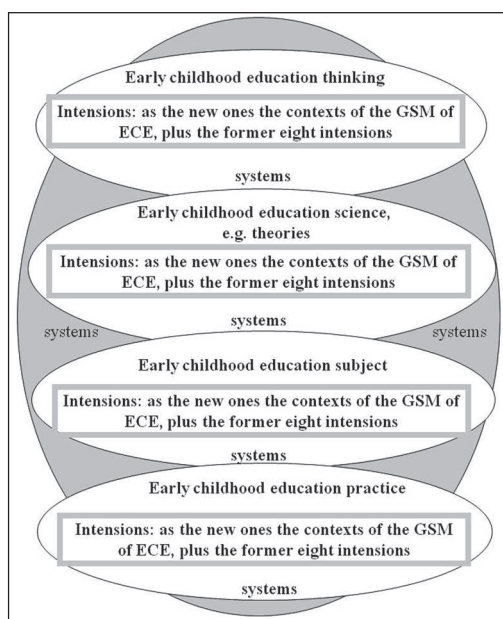
Figure 3. Pedagogical systems theory and its core value contexts, presented as a systems model (Härkönen Ulla 2008)

It is said (Church, 2001) that the intension of a concept consists of the qualities or properties which go to make up the concept. Logically the same content must be included in every extension because otherwise the question cannot be about the same concept (early childhood education). That is why Figure 1 must be put inside each extension of Figure 2.

Now the four extensions and new pedagogical intensions are found for the concept of early childhood education (Figure 3). But also the earlier eight intensions are still valid because they can be found in Figure 1: the concept of care have its own context area, education belongs to all contexts, teaching has its own context area, learning and development lies there in views on human being, concepts of socialization and civilization and spiritualization belong to the area on human being but these are united as the whole system.

However, it must be said that the new intensions (Figure 1) for the four extensions of the concept of early childhood education (ECE) are much more informative. They give a clear pedagogical content for the extensions of the concept of early childhood education (ECE). They have long-term sustainability. Instead of that the former intensions, which are depicted in Figure 2, have not so solid, harmonious and continuous sustainability in history, but all of them can be found in different combinations in literature, however.

We can notice that *care* is only an intension of the concept of early childhood education, not a separate concept. In the systems context of early childhood education, *care* gets an educational character and goals. That also means sustainability in caring activities because doing caring activities in this way suggests developmentally and educative appropriate action.

Discussion

Due to the title of the study the next question arises: *How do the new pedagogical systems theory and the corresponding model function for sustainable human development?*

The most important characters of the pedagogical systems theory and the corresponding model are that they represent historical, pedagogical, systemic, holistic and comprehensive, diverse and pluralist, interpretative and semiotic, egalitarian, democratic and tolerant values. These kinds of values can construct sustainable education which takes account sustainability also in children's, teachers', parents' and all human beings' development (Schreiner, 2009). All this is important in an intercultural dialogue all over the world (Council of Europe, 2008).

The author thinks that the thoughts of Jämsä (2006) could well characterize sustainable education which could for one's part promote sustainable, good and healthy human development, also cultivate, civilize and spiritualize human beings from outside and inside.

Diverse ways – which are present in this theory and model – cannot, however, offer fully freedom to do everything whatsoever everybody wants. The risk is that it is wanted more and more about children's development, more than their optimal developmental limits allow. If the teachers and adults encumber children's development, they exploit the optimal possibilities for well-being. The principles of equity, restriction, limitation and control of teachers', parents' and society's activities are needed in education and in ambitions according to children's development.

The further research might concentrate on *value contexts* of the new layered systems model of early childhood education, the possible influences and meanings in relation to human development.

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