

HOW THE DIALOGUE BETWEEN COGNITIVE, CONATIVE AND AFFECTIVE CONSTRUCTS IN ENTREPRENEURIAL AND ENTERPRISING LEARNING PROCESS IS EXPLICATED THROUGH CONCEPT MAPPING?

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Abstract The question of how to learn entrepreneurial and enterprising behavior has recently become one of the core questions in entrepreneurship education. Our approach to entrepreneurial and enterprising learning allows us investigate “how the cognitive, conative and affective self-regulating abilities interplay in entrepreneurial and enterprising learning process?” To contribute to this stream of research this paper adopts the three-partite constructs of the personality and intelligence originally introduced by Snow, Corno and Jackson (1996) and further applied to entrepreneurship education by Ruohotie and Koironen (2000). This research consists of the two year follow-up reflections of 18 university students who participated in two consecutive study programmes of entrepreneurship education during years 2003-2006. The programme adopted entrepreneurial and enterprising pedagogy. Textual data consisted of 400 pages of reflections. Research methods and data analysis followed a two-part progression: 1) The application of Straussian Grounded Theory with the coding proceeds through open, axial and selective phases, 2) the concept map method. The results indicate that all constructs appeared in these entrepreneurship education learning interventions as well and transitions between them. However, the disappearance of affective construct in meta-level reflections emerged. The focus of this article is to present the aims and the results of this study. Although, we want to stress the methodological aspect of concept mapping. The article gives some views to develop ‘pattern matching’ and reliability of concept mapping.

1 Introduction

The question of how to learn entrepreneurial and enterprising behavior has recently become one of the core questions in entrepreneurship education. Our approach to entrepreneurial and enterprising learning allows us investigate “how the cognitive, conative and affective self-regulating abilities interplay in entrepreneurial and enterprising learning process?” This paper is organised according to our research question. First we have a slight insight into entrepreneurship, and entrepreneurial and enterprising learning; and the dynamics of cognitive, conative and affective constructs and meta-level self-regulating abilities. This is followed by a description of the research design and methodological approach. After that we report the results, discussion and ideas for future research. Even though our aim is to describe a research the main focus of this article is to present the methodological aspect of concept mapping and its utility in research.

2 Concepts and Theoretical framework

Entrepreneurship is a complex idea and entails a wide range of beliefs. Some believe that entrepreneurship must involve risk-taking individuals who start new ventures that are innovative and experience rapid growth. Others may only focus on the idea that entrepreneurship is about starting new ventures. When we talk about entrepreneurship we should recognize that it has many different meanings attached to it (Gartner 1990). To define entrepreneurship we also invoke the terms *enterprising and entrepreneurial*. Considering the differences between these terms the only major distinction that can be made is that an entrepreneur is traditionally associated with business activity (Gibb 1993). To avoid confusion and be exact, in this article are used explicitly both concepts, entrepreneurial (referring to the business context) and enterprising (referring general education and learning processes). The self-regulation and its future orientation aspects are focal elements in entrepreneurial and enterprising learning and behaviour (Linnakylä & Välijärvi 2005, PISA). *Self-regulation* enables goal-setting, strategy development and creative thinking which as a consequence enable motivation development and goal achievement. Self-regulation plays a major role in high level achievements and performances (Tiedemann 2000).

The question of how to learn entrepreneurial and enterprising behavior has recently become one of the core questions in entrepreneurship education. Our approach to entrepreneurial and enterprising learning allows us investigate “how the cognitive, conative and affective self-regulating abilities interplay in entrepreneurial and enterprising learning process?” To contribute to this stream of research this paper adopts the three-partite constructs of the personality and intelligence originally introduced by Snow, Corno and Jackson (1996) and further applied to entrepreneurship education by Ruohotie and Koironen (2000). As Snow, Corno and Jackson (1996, p. 243) argue, these three modes of mental functioning have been historically distinguished but are still regarded as interactive elements in human intelligence and personality. The following Figure 1 indicates the interplay between constructs and metaconstructs of personality and intelligence.

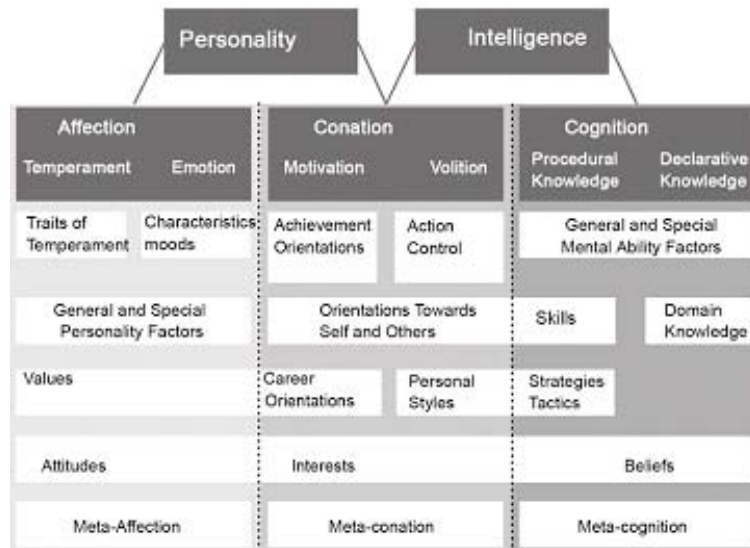


Figure 1: Constructs and metaconstructs of personality and intelligence (Combined: Snow, Corno & Jackson 1996, p. 247; Koiranen & Ruohotie, 2000, p. 104) and complemented with Metal-level construction

The *cognitive construct* contains declarative and procedural knowledge. The distinction between these is that the former refers to the way we link concepts together and the latter to our abilities to apply this knowledge. *Conation* is divided into two parts: motivation and volition. The motivational factor includes among other things internal and external goal-orientation, fear of failure, need for achievement, self-esteem, belief in one's own abilities and prospects, all of which are at the core of enterprising learning. Volitional structure entails among others, persistence, the will to learn, endeavour or effort, mindfulness in learning, intrinsic regulation and evaluation processes as well as different control strategies. (Ruohotie and Koiranen 2000.) Motivation precedes volitional processes to formulate the goals, but volition guides in setting clear goals as well as in the enactment and realisation of the decision. Thus both of these factors are essential in entrepreneurial and enterprising learning. *Affection* is divided into temperament and emotion. Temperament is more lasting and hardly dependent on individual situational factors, while an emotion may be strongly linked to a situation. If affection is embedded in all situations and each individual has his/her own temperament, it is hard to see that we can isolate these from a learning situation. For example, research in the field of fear of failure is deeply embedded in the concept of emotion and also temperament. A need for achievement can also be seen from an affective perspective. At a deeper level the affective construct relates to our values and attitudes. To put this simply, what we regard as valuable guides our willingness and interest to learn. Thus the affective construct is as fundamental to our learning as the conative construct.

These propositions finalise our approach to entrepreneurial and enterprising learning and allows us investigate "how the cognitive, conative and affective self-regulating abilities interplay in entrepreneurial and enterprising learning process?" This approach consists of three categories of self-regulatory abilities; meta-cognitive ability referring to the cognitive construct, conative meta-ability referring to the conative construct and affective meta-ability referring to the affective construct. We are aware that this proposition is open to criticism, especially considering that the dynamics of these meta-level processes are drawn from and developed by cognitive psychology. However, we also argue that perhaps the role of affective self-regulatory processes is neglected aspect in this debate and thus provides an opportunity to contribute into research in this field. This complexity also gives us methodological challenges. How to find methodological solutions for investigating this kind of dynamics? The solution we decided to adopt was a combination of Straussian grounded theory and concept mapping approach and technique.

3 Methodology

The textual data consisted of the two year follow-up reflections of 18 university students who participated in two consecutive study programmes of entrepreneurship education during years 2003-2006. The programme adopted entrepreneurial and enterprising pedagogy. The data consisted of 400 pages of reflections from seven modules, altogether 90 documents, out of which 36 were group documents (18 students * 7 modules = 126-90=36). The reflection instructions to gather students' experiences were same in all modules. The reflection format was based on action research studies. It guided towards three levels reflection; technical, practical and

critical levels and to focus on the learning of an individual, the group and the course as well as an organisation and society.

The coding scheme was carried out within NVivo 7 qualitative data analysis software (QSR NVivo 7.0.281.0 SP4, 2007), while the construction and analysis of map representations expands NVivo's modelling functionalities by utilizing IHMC CmapTools concept mapping and knowledge modelling software (IHMC CmapTools 4.11, 2007; see e.g. Cañas et al, 2004). The resulting matrices were exported from the software to be processed further in spreadsheet and concept mapping software to summarize the results in meaningful representations.

Research methods and data analysis followed a two-part progression:

1) *The application of Straussian Grounded Theory with the coding proceeds through open, axial and selective phases:* The method of Grounded Theory has been recommended for those fields with few established theories, lacking sufficient knowledge or concepts or when new perspectives are of special interest. It is suitable for this research from all these three perspectives, since we know very little about the dynamics of how the cognitive, conative and affective self-regulating abilities interplay in the entrepreneurial and enterprising learning process. Influenced by pragmatism and social interactionism, Glaser and Strauss suggested that there was a need on the one hand to respect and reveal how the actors perceive phenomena and on the other hand to develop methodological tools for that. (Glaser & Strauss, 1967).

2) *The concept map method:* Concept mapping as defined by Novak (1998) and further developed by Åhlberg (2001) was applied as the basis for representations of research findings. By its' definition concept mapping provided a meaningful way of representing relational structure of the results of analysis.

As Jackson and Trochim (2002) argue this methodology is well suited for open-ended survey text data (or like we consider for reflection data as well) because it combines the strengths of word-based and code-based methodologies while mitigating some of their weaknesses. Through the word based approach it is possible to recognize reoccurring patterns or words, and on the other hand, retaining the context of these concepts and a desire to analyze the responses as a set representing the whole sample make code-based analyses also a very appropriate basis for concept mapping. Therefore, this mixture of thematic and word-mapping approaches in concept mapping has been seen us a very appropriate way to make interpretations about students' reflections. For example the following example may illustrate the mixture of these approaches in this research:

*"I **received** theoretical substance among other things about the parameters related to computation and economics in the starting phase of an enterprise. I **learned** that from the parameters it is quite easily to deduct the viability and economical stability of an enterprise. The process of constructing a business plan from a give model took form through the good material and the instruction from the entrepreneurship center."* (The words which were regarded to refer cognitive construct are in the text with bold style – on the other hand, the example as a whole represents a good sample of cognition expression.)

The data collection in concept mapping is an ongoing, iterative basis, and where the researcher keeps on adding to the sample until there is enough data to describe what is going on in the context or situation under study. This process goes on until "theoretical" saturation is reached. As a consequence of theoretical sampling, coding, constant comparison, the identification of the core variable, and the saturation of data, categories and codes, the grounded theory emerges from a data in an unforced manner (Cohen, Manion & Morrison 2007, p. 491 - 495). Therefore the coding process of this study, building towards the grounded theory, included "operations by which data are broken down, conceptualised, and put back together in new ways" (Strauss & Corbin 1990, p. 57).

In the *open coding phase* the topical content of the reflections and their related meta-level expressions were identified. In the *axial coding phase* first the references and meta-references were identified and organised according to the three constructs as a mini frame work. Then, by further adopting the three-partite constructs of personality and intelligence, these were organised according to different elements of each construct and presented as a concept map. Finally the transitions between these constructs were analysed. (see e.g. Åhlberg, 2004). In the *selective coding phase* core categories are chosen and systematically related to other categories validating those relationships. This provides a tentative model or a theory for further development.

However, the concept map itself does not constitute a theory regarding the effect of our program of learning entrepreneurial and enterprising readiness which we assume is structured on three-partite constructs. As

Trochim (1989) points out to achieve such a theory we need to state how the independent variable (for example our intervention) is related to the concepts on map. For instance, after reviewing the intervention in detail, we might conclude that some aspects of this three-partite constructs of personality and intelligence on the map will be most likely strongly affected than others. Specifically, we have overlaid our expectations about intervention effects onto conceptual structure, presenting where it will affect some concepts and not others. Thus, the concept maps in this study can act as the framework for a statement of theory, but can not be considered as a theory in and of themselves. Like Trochim (1985; 1989) suggests the further use of “pattern matching” could be appropriate for us which works best when there is a clearly articulated, detailed theoretical pattern. These detailed patterns are more likely to be unique and a match will, consequently, be attributable to this unique theoretical “fingerprint”. This research takes first steps towards this approach.

The reliability and validity of concept mapping was considered in the study according to and Jackson and Trochim (2002) who constructed their ideas on Krippendorff (1980) work: a) some units are more difficult to code than the others; b) some categories are harder to understand than others; c) subsets of categories can sometimes be confused with larger categories; and d) individual coders may be subjective.

4 Results

Open coding: First 1686 expressions were coded and then categorised according to their topics. All together 25 topics were identified and out of these 72 percent focused on seven categories. 242 meta-level expressions were identified among these 1686 references. From these 239 (99 percent) were identified in seven topical categories. Thus since our research question concerns self-regulating abilities these are most valid to us. Table 1 presents these frequencies.

Table 1. Topical categories and their references and meta-level expressions

Topical categories	Documents / category		Documents with Meta-level expressions		References/ category		References with Meta-level expressions	
	Number	%	Number	%	Number	%	Number	%
Learning and change	80	89	43	48	117	6,9	70	28,9
Collaboration, group dynamics	90	100	35	39	125	7,4	60	24,8
Studies and praxis	67	74	26	29	287	17,0	36	14,9
Individual work and processing	58	64	22	24	326	19,3	34	14,0
Time as resource	49	54	15	17	146	8,7	21	8,7
Joy, positive experiences	49	54	7	8	88	5,2	8	3,3
Teaching and pedagogy	48	53	9	10	117	6,9	10	4,1
Others 18 different categories					480	28,5	3	1,2
Documents N=90					1686	100	242	100

The meta-level reflection was defined by criteria, which allows taking into particular account the temporally regular nature of producing the reflection texts over a lengthy period of time. This is performed in explicit order to control and/or understand the relevant factors affecting own studying action and its' conditions. Expressions can also serve as foundation for planning or anticipation of future events and action explicated in text. Thus the inherent *meta-levelness* of the category refers to learning as reflected through explicating observations of how things keep changing, as different phases, activities and conditions of the path sequentially become active.

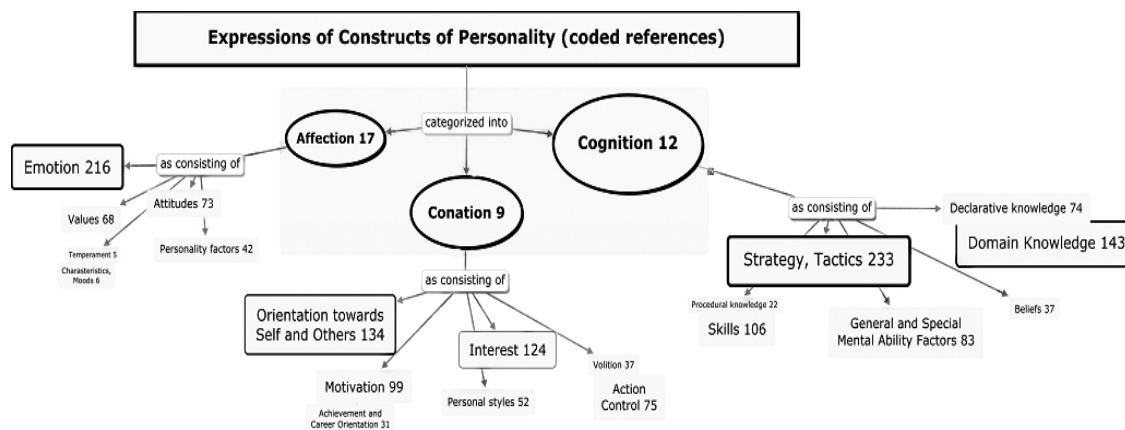
Topical category	Examples of expressions
1.Learning and change Expression	My view on entrepreneurship and entrepreneurial education expanded. I read quite a lot of new material that was mainly interesting. Hence, learning took place ...
Meta-level expression	On the other hand, the recognition of also this deficiency is an essential thing for my own development because for my own action as an educator of adults in the context of entrepreneurial education to evolve I must understand the diversity of the learners' starting points.

Axial coding: The distributions of the 1686 references and 242 related meta-level references are presented in Table 4 and examples of their expressions in Table 5.

Table 3. References and meta-level references according to the three-partite constructs of personality and intelligence

Construct	References		Meta-level References		Meta-level as % of total references
	Number	%	Number	%	
Cognition	698	41,4	169	69,7	24,2
Conation	561	33,3	57	23,6	10,2
Affection	427	25,3	16	6,7	3,7
Total	1686	100	242	100	

To look into these in more detail we constructed a concept map describing the relationships inside each construct.



(size of a sub-category relates to the frequency of coded references, size of the main construct to the relative size summed from the frequency of references in the sub-categories)

Figure 3. Expressions of constructs of personality with their associated sub-categories.

Construct	Examples of expressions/references
Cognition Expression	Domain knowledge: <i>“I received theoretical substance among other things about the parameters related to computation and economics in the starting phase of an enterprise.”</i>
Example of meta-level expression	Domain knowledge: <i>“[...]My knowledge on countryside travelling business is also too shallow. For this there is literature available, but a training session by an institute would be in order.”</i>
Conation Expression	Action control: <i>“Nobody has to be dragged along with the group but everyone strives to do one’s best and invest in the effort.”</i>
Example of meta-level expression	Action control: <i>“I felt myself receiving something else in exchange. I was the first to announce that “I’m allowed to do what I want”. This was the element of freedom that also the research indicates entrepreneurship to bring.”</i>
Affection Expression	* <i>“I felt truly happy. [The beginning of the 15 credits unit suited me well timing wise.]”</i>
Example of meta-level expression	<i>“[...]Also it was obvious from observing the peer-group activity, how it had evolved. Most of the groups had truly examined their peer-group’s work and considered the possible improvements to be implemented. In this sense, the peer-group activity should be first and foremost consoling, seeking for the positive and good qualities and aimed at improving the products, sustaining not that much focus on the negative or failed things.”</i>

Within the cognitive category's sub-categories the reflection focuses on the areas of strategy and domain knowledge. This is largely due to the students' tendency to reflect on the decisions done in order to solve different kinds of problems mainly related to coordinating collaboration and organizing own action accordingly. The understanding of the strategic reflection being connected with collaborative operations gets support even on this level of representation, while viewed in context with the results from the open coding stage and especially when observing stress being received by the 'Orientation towards Self and Others' sub-category within the conative content.

The second large sub-category within cognition labeled 'Domain knowledge' should also be investigated in close contact with the previous two. At the same time it is instructive to view it alongside with the understanding of the prominent weight that comparative reflection on studies and praxis represents within the results of open coding. Here, looking at the open coding category, 'Studies' are seen as both the content and materials used in teaching, and also the pedagogically grounded action of the task setting. 'Praxis' in turn is the professional and everyday experience of the student related to the subject of teaching and studying.

In addition to the interplay between cognitive and conative constructs within the reflected content, the main finding at this point of analysis is the apparent significance of the amount and quality of action for the processes being accessible to reflection. The strong presence of the elements of 'Procedural knowledge' presented by the reflection on *how to act* gets even stronger, when taking into account the amount of reflection on skills. Skills can be reflected as either being learned as a result of studying or as operating as resource or limitation for the variety of strategies being available for application.

Secondly the aforementioned generally positive nature of the reflection reveals itself here, too. The content related to the construct of affection holds within the second largest, single theoretical category of 'Emotion'. This is due to students' notable tendency to eagerly name and point out positive feelings and emotion throughout and across the reflection on different themes – to say, events, activities, and stages of the study path.

At this stage we can say that all three constructs are present and also that action and positive emotions are extremely visible within these constructs and also that the reflections are written as interplay between these three constructs. However, to look more deeply into their interplay we still identified the transitions between different constructs. Transition is defined as a distinct, sequential passage within text from reflecting one construct to reflecting another, throughout which the narrative and thematic focus remains unbroken. The analysis of such transitions was done to understand the dynamics of reflecting constructs of personality in more detail, e.g. in which kinds of sequences do constructs get reflected in context with one another. Among 1686 references 238 transitions were identified. Their relationships are presented as a concept map in Figure 4.

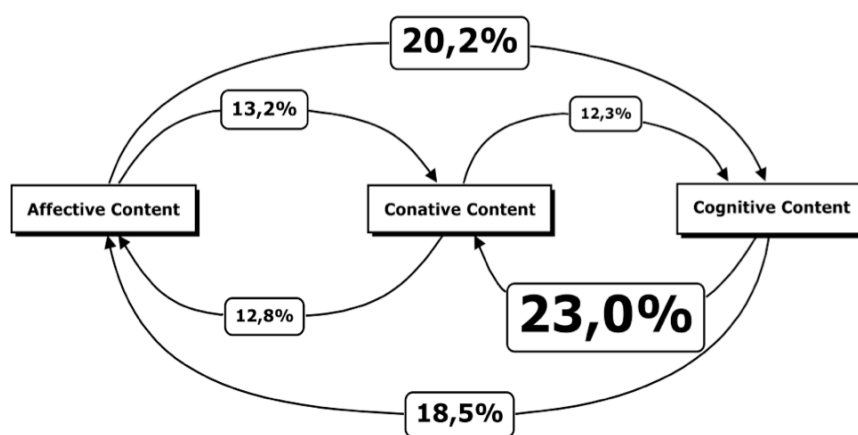


Figure 4. Transitions between the constructs (N 238)

Transitions	Examples of expressions
From cognitive to conative	Will the assignment fail, if the references aren't the "correct ones"? When searching for the idea of the entrepreneurship education, from the perspective of the subject, this is in turn an "academic" conflict which is the evaluation criteria used for not ending up "murdering souls" once again? On the other hand, there emerged an idea, that we definitely won't be content with ourselves receiving "less than two" [for a grade]... ..this to notify [teacher], even though we're not promoting rivalry for it's own sake.
From affective to cognitive	* I experienced a sensation of insight each time I started to work on a new paper; yet again I'd learned to think about things from another perspective.
From cognitive to affective	* During the 15 credits at hand, I've aimed at extracting as much as possible out of the subject. Even though the studies have taken time –meetings, emails, reading, writing- studying has been in general rewarding and good for self esteem.

Now looking at the relationships between three constructs, it becomes obvious that all of them are important in learning interventions. Cognitive related relationships cover 74 percent of transitions, conative related 61.3 and affective related 64.7 percent. The transitions between the three constructs take place in all directions. The most coded transition is from reflecting cognitive to conative content and the second-most coded transition is from affective to cognitive construct. It is a very common pattern within the data for the reflective writing sequences to initiate from recollection of having distinct emotions connected to different stages of the studying path and the related actions. This can be seen as an indication of how the catalyst nature of affective construct manifests itself also within reflection.

Selective coding: Now, as the selective coding assumes, we can select the core categories and relate them to other categories thus compiling a tentative model for further development. As Strauss and Corbin (1990, 116-142) express it "put the data back in new ways" check quote

The open coding indicates that action orientated pedagogy stimulates reflections and meta-abilities. Collaboration seems to be the key element of the learning and meta-learning of entrepreneurial and enterprising readiness. The research design of this study enhanced entrepreneurial and enterprising learning process.

Axial coding shows how all three constructs; affective, conative and cognitive, are present and involved in the three construct dynamics, although metalevel affective reflections are missing. Conation orientation towards others and self are reflected the most which is presumably grounded on the fact that courses designed were based on the collaborative pedagogy.

5 Discussion and ideas for future research

These results indicate that all constructs emerged in these entrepreneurship education learning interventions as well and transitions between them. The study indicates how affective meta-abilities, affective, conative and cognitive, constructs determine our learning processes. Thus to take into account more this interplay might help to enhance entrepreneurship in general.

However the disappearance of affective construct in meta-level reflections might reflect our poor ability to enhance entrepreneurial attitudes and values both found important for example in research of intentions. Strengthening these underrepresented elements might enhance students' reflection and self-regulation processes and as a consequence empower entrepreneurial and enterprising learning. Such ideas encourage us to suggest that this stream of research should get more emphasis in entrepreneurship education research.

However, it should be noted that even the key concepts and their relationship are defined this research still is a very tentative and thus need a lot of efforts to reach the state of theory. Our tentative model as a suggestion for further explorative research in authentic settings to be developed towards theory is that: affection stimulates action in the cognitive construct and collaborative learning stimulates action and affection. Conative construct is stimulated by action.

Thus, in the future, the use of 'pattern matching' in concept matching (Trochim 1985) could be valuable since it could generate and scale our theoretical expectations, relationships and outcomes, in more detail. Hence, the questions of reliability and validity in concept mapping (Jackson & Trochim 2002; Krippendorff 1980) should be considered more precisely, since we overcame with all these difficulties: a) some units are more

difficult to code than the others; b) some categories are harder to understand than others; c) subsets of categories can sometimes be confused with larger categories; and d) individual coders may be subjective. Therefore, we would see that in the future research we could develop a) *criteria reliability* for units and categories and b) *inter-rater reliability* referring to the fact of using more than one researcher in coding of same data.

References

- Ahlberg, M. (2001). Concept mapping as a research method. www.metodix.com/showres.dll/en/metodit/methods/metodiartikkelit/kasitekartta_tutkimusmenetelmana/
- Ahlberg, M. (2004). Varieties of concept mapping, Proceedings of the First International Conference on Concept mapping, Vol. 2, 2004, pp. 25-28.
- Cañas, A. J., Hill, G., Carff, R., Suri, N., Lott, J., Eskridge, T., et al. (2004). CmapTools: A Knowledge Modeling and Sharing Environment. In A. J. Cañas, J. D. Novak & F. M. González (Eds.), *Concept Maps: Theory, Methodology, Technology. Proceedings of the First International Conference on Concept Mapping* (Vol. I, pp. 125-133). Pamplona, Spain: Universidad Pública de Navarra.
- Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education*. 6th edition. London. Routledge.
- Gartner, W. B. (1990). What are we talking about when we talk about entrepreneurship? *Journal of Business Venturing*, 5, 15 – 28.
- Glaser B. & Strauss A. (1967). *The discovery of Grounded Theory*. Aldine: Chicago.
- Gibb, A. (1993). The Enterprise Culture and Education. Understanding Enterprise Education and its links with Small Business, Entrepreneurship and Wider Educational goals. - *International Small Business Journal*, 11, 3, 11-24.
- Jackson, K.M. & Trochim, W.M.K. (2002). Concept Mapping as an Alternative Approach for the Analysis of Open-Ended Survey Responses. – *Organizational Research Methods*, 5, 4, 307-336.
- Krippendorff, K. (1980). *Content Analysis. An introduction to its methodology*. 5th edition. Newbury Park: Sage.
- Linnakylä, P. & Välijärvi, J. (2005). Finnish students's performance in PISA. Why such a success. *Forum Jugendarbeit International*, 1, 284-297.
- Novak, J. (1998). *Learning, creating and using knowledge. Concept Maps™ as facilitative tools in schools and in corporations*. London: Lawrence Erlbaum.
- Ruohotie, P. & Koironen, M. (2000). In the Pursuit of Conative Constructs into Entrepreneurship Education. - *Journal of Entrepreneurship Education*, 3, 9-22.
- Snow, R.E., Corno, L. & Jackson, D. (1996). Individual differences in affective and conative functions, in D.C. Berliner & R.C. Calfee, eds. *Handbook of Educational Psychology*. New York: Simon & Schuster Macmillan, 243 – 310.
- Tiedemann, J. (2000). Parents' gender stereotypes and teachers' beliefs as predictors of children's concept of their mathematical ability in elementary school. *Journal of Educational Psychology*, **92**, 144–151.
- Trochim, W. (1985). Pattern matching, validity, and conceptualization in program evaluation. *Evaluation Review*, 9, 5, 575-604.
- Trochim, W. (1989). Concept mapping: Soft science or hard art? In W. Trochim (Ed.) *A Special Issue of Evaluation and Program Planning*, 12, 87-110.