TRACKING CONCEPT DEVELOPMENT THROUGH SEMIOTIC EVOLUTION

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ABSTRACT

A qualitative research focused on a case study aiming to monitor emergent knowledge in a discourse group by tracking the development of the concept 'goal'. The analysis, based on 'Semiotic Evolution' methodology facilitates the description of interactions between personal perceptions in the group discourse, illustrating the change process and signs development. It is suggested that knowledge was emerged from a free, self-organized discourse interaction which was encouraged by a constructivist leadership. The new knowledge was manifested by expanding the boundaries of the concept 'goal' and it changed the members' behavior. Understanding emergent knowledge is useful in teaching and Teacher Education processes as well as in Adult Education.

Keywords: Discourse Community; Emergent Knowledge; Semiotic Evolution; Complex System.

INTRODUCTION

One of the challenging researches in teaching and teacher education is the attempt to understand the processes of knowledge emergence. The constructivist approach which views learning as an active process of self-construction of knowledge and competences is often implicit. A discourse in which questions are asked while looking for creative understanding may serve as an efficient platform for monitoring implicit connotations as well as explicitly discussed concepts through developing new meaningful interpretation (Armstrong, 2012).

Since the topic 'goal' concerned the author in her field of work when leading a change of college - school collaboration, the author raised it for debate in the discourse community. Conversely, a decision not to set goal and objectives underlined the discourse in the community while understanding processes which lead to the growth of knowledge.

This paper explores the development of the concept 'goal' in the discourse community over time; the change in its meanings; the effect of the change on the discourse community and on author's conduct in the field.

Enlightening the development of concepts indicated on knowledge emergence, is useful and relevant to teaching – learning processes as well. These insights can also be implemented in various Educational frameworks and during teacher training.

Theoretical Background

Discourse Community

A discourse community is a group of individuals who develop thoughts, feelings, ideas, beliefs, and attitudes in collaboration to reach consciousness existence and knowledge development (Teubert, 2010). Knowledge development processes are at the basis of the constructivist approach which views learning as an active process of self-construction of knowledge and competences. This process is nurtured systemically by knowledge sources within individuals and outside them as well as in various contexts (Keiny, 2002). A suitable framework for conducting a learning-promoting reflexive dialogue is a discourse community. The discourse community members demonstrate tolerance for various perspectives and different opinions presented by community members, and they are flexible and open to a new personal and professional experience (Lambert., Walker, Zimmerman, Cooper, Lambert, Gardner & Slack 1995). As argued by Dewey (1969), the discourse

community facilitates the establishment of internal relations between members who support their discourse peers, display interest in their activity, and find similarities in their practice and in this way, they also develop.

Knowledge Development in a Discourse Community

A discourse community is focused on knowledge development process which allows various and contrasting interpretations of the discussed topic, while the members who hold distributed cognition interactively contribute to the emergence of the new knowledge (Bereiter, 2002; Lansing, 2003). A discourse in which questions are asked while looking for creative understanding may develop new meaningful interpretation (Burbules & Bruce, 1993). Similarly, Perkins (2000) relates the comprehension of the knowledge development process during discourse, emphasizing the importance of people to display cognitive flexibility, which is manifested by their ability to demonstrate performance and tolerance to different interpretations and conflicting subject matters. These allow all participants to face challenging perspectives and show tolerance for ambiguity, while the discourse community leader is also expected to waive hegemony and to enable responsibility sharing (Diotaiuti, Marco-Zona, & Rea, 2015; Paul, 1990; Ronen, 2015). The objective of the learning process is to create a meaning manifested by understanding concepts and applying them in various contexts as part of knowledge development in the discourse community as well as during student teachers training. This development could be analyzed by the semiotic model.

Semiotic Evolution Model for Concept Analysis

A research field which facilitates the analysis of concept meanings as they are perceived by the members was grounded in the semiotic model conceived by the American philosopher Charles Sanders Peirce (1839-1914). The word 'semiotic' evolved from the Greek word 'sign' since the model engages in signs and the way messages are transmitted in different contexts. The meaning of semiotic is a recurrent process of understanding and internalization based on dynamics of knowledge formation in a series of continuously structured understandings. According to Peirce`s approach (1960), one can view learning as processes of sign interpretation designed to make the world better understood. These cognitive processes include various types of signs whereby each element is part of a branched and complex network of interpretations in interactive systems of actions so that every process induces and brings about one process or more. Since learning is defined as a change of capabilities (Pikkarainen, 2011), implementing a semiotics model which is associated with action, capability and causality, may reflect a learning process.

As far as the issue of deriving a meaning is concerned, semiotics relates to the sign as a meaningful unit when it examines message transmission methods, meanings presentation methods and meanings comprehension methods by means of language. The connection which individuals make between the word and its subjective meaning or interpretation reflects their perception and cultural context. Meanings and interpretations are affected by the experiences of discourse community members and they are constantly changing. Hence, analyzing the meaning of a concept taken out of a discourse text by means of the semiotic approach is, in fact, a search for the group concept (or the knowledge). Peirce's semiotics evoke a focus in semiotic processes which characterize and orient the dynamics of knowledge formation as it transpires in a group (Strand, 2012). The changes which occur over time in the meaning of words and with the development of the discourse in the community are depicted by Taborsky (1997) as 'Semiotic Evolution'. The outcome of the processing following the interpretation is a new sign and it is what remains after the learning. Since every reader understands the sign in a unique and personal context, then different meanings might be attributed to the same sign by different members and the meaning intended by the member who produced the sign has no priority from the point of view of validity or importance. That is, the 'Semiotic Evolution' process takes place on both the level of individual reality and of group reality which are interrelated (Taborsky, 1997). Semiotic evolution is a

possible way for monitoring the knowledge development process in the discourse community (Avriel-Avni, & Keiny, 2010) and it will be illustrated in this paper. On the other hand, the process of new knowledge growth enables examination of interactions between members of the discourse community to which one can relate as a complex system.

Discourse Community as a Complex System

Features of complex systems, known from life sciences and social sciences (Goldenfeld & Kadanoff, 1999), can also be identified in social areas such as discourse community (Kaufman, 1993; Simon, 2002). Similarly to complex systems, discourse community members mutually affect each other by a network of interactions. The discourse interaction is affected by feedback cycles thus, a positive feedback amplifies a certain behavior whereas a negative feedback dampens it. A discourse community, like a complex system, is undergoing a process which is usually nonlinear and sometimes, even chaotic, inducing it to change and develop but renders it hard to predict its trend. In fact, three basic patterns can be identified in a complex system: a linear pattern which might develop by stages whereby a temporary equilibrium is created in the system and is later disrupted. The second is a diverging pattern, formed when there is a dominant positive feedback which stimulates and enhances its action and might sometimes lead to its collapse. But when there is a blocking negative feedback (Sterman, 1994), an Attract towards which the system converges, a goal-seeking pattern is formed. These three patterns can be identified in different stages of a complex system development (Kauffman, 1993; Simon, 2002).

Complex systems have additional features which are also typical of a discourse community. For example, nonlinear relations according to which a small change can have a strong impact on the system (referred to as the 'Butterfly Effect'); effect of the external environment on complex systems, defining them as open systems and requiring an ecological observation of 'inside' and 'outside' in order to understand what is going on in the system (Keiny, 2002); growth and development of a complex and high level emergent behavior resulting from an inner dynamics of

the relations setup on a low level, similarly to a self-organizing system (Bereiter, 2002; Goldenfeld & Kadanoff, 1999; Kauffman, 1993; Simon, 2002). Investigating the knowledge development process of the concept 'goal', which served as a point of contention between the author and the discourse community, has been done using the semiotic evolution methodology, and can be also used as a research for understanding learning – teaching process.

Research Questions

- What are the changes over time in the meaning of the concept 'goal' based on a discourse community analysis?

- What are the factors which may support the emergence of new knowledge in a discourse community?

Insights on the factors supporting emergent knowledge can also be useful while implementing various Educational frameworks and during teacher training.

Methods

The Context of the Study

The author became a member of the discourse community consisting of nine members, each of whom is active in leading change processes in various educational frameworks. The group met once a month and discussed educational topics nurtured by theoretical sources and occurrences in the personal-professional field of each member, intended to better understand how knowledge develops in a discourse community. The author repeatedly experienced hesitations and queries regarding the method and goals of leading a change in her professional field and this found an expression in the discourse community.

Participants

The research is focused on a discourse group including a nine member group meeting once a month for three years (2011-2014). New members joining the discourse community and elucidating the objective of the group discourse enabled exposure of the latent members' connotations associated with the concept 'goal'.

Research Methodology

The methodology is taken from a study conducted by Avriel-Avni & Keiny (2010) and is grounded in the model conceived by Kim (1996) for text analysis by means of 'semiotic evolution'. According to this methodology, a semiotic system is changing throughout the discourse; a new meaning is attributed to old signs and new signs are formed (Kress, 2001). The semiotic evolution analysis presents the different meanings (connotations) raised by the members in relation to the concept 'goal', the binary opposites which clarify their intentions and based on them, and the different perceptions of the discourse members that can be indicated.

Data Collection Tools and Data Analysis

Data were collected from eight sessions which took place during the years 2011-2014 including four sessions in which a new member joined the discourse community. New members joining the discourse community and elucidating the objective of the group discourse enabled exposure of the latent members' connotations associated with the concept 'goal'.

The method requires reading and re-reading of texts, both in order to locate the key concepts and also to pull out the various connotations to these concepts. In this case, using analysis computer program for key concept scanning was not effective since the 'key sign' was often indirectly mentioned. Text analysis was approved by a second content analysis expert. The advantage of this systematic and logical methodology is reflected in monitoring the developing concepts evolution.

Monitoring the changes in the signs with the development of the discourse consists of three stages: withdrawing major signs out of the discourse transcriptions - requires reading and re-reading of transcripts, enables retrieval of signs or concepts, which reappeared in most transcripts over the years, or those treated in depth during several conversations; connotations identification, namely meaning of the sign attributed by the members pull-out from the transcripts direct and indirect references to the main signs; and binary opposites which explain the sign by different ways (categorization, meaning contrasts or whole-parts relations) – enabling to track the binary oppositions within the text, which describe and define the signs, helped identification of connotation or meaning given to marks (Kim, 1996).

The connotations appear by the chronological order of their emergence in the discourse and their meanings are analyzed during the discourse. The systematic and logical monitoring process facilitates identification of new meanings of the investigated concept as well as the process of the new knowledge growth (Avriel-Avni & Keiny, 2010).

Parallel to the discourse analysis which illustrates the semiotic evolution of the concept 'goal', the process of self-organizing interaction in the group is described, as well as implications of the discourse on the members' activity in their field of practice outside the group. In each of the discourse sessions there is a citation of the members' words and a table which summarizes connotations associated with the concept 'goal' together with their binary opposite.

Findings

The first group discourse describes a session to which Ness, a new member, came wanting to understand what is going on in the community. The group members' words illustrate the activity in the group and their perception of their practice as an attempt to build knowledge about group discourse.

Shosh: "it is likely to assume that there is some personal interest which is being satisfied"…

Ness: "I don't know what you are talking about… I am trying to delve deeper"…

Eti: "Observation of the group… concepts that come up… An attempt to structure knowledge out of it… No definition of goals and time".

Yael: "The conversation is oriented towards the subject and following this reflection it definitely affects what we are doing … Here we have no definition of time, process, or goal".

Shosh: … "we have the presumption to take out of it, to build here some new area of knowledge which relates to a group discourse"… (May, 2011).

The community members' attempt to explain to the new member Ness, the nature of the group discourse gives rise to connotations describing the concept 'goal' by two of the members. The group leader, Shosh (S.) defines goal as a response to personal interest derived from an internal driving source which is satisfied in the community. Eti (E.) defines goal as a knowledge-building observation process. According to them, a binary opposite of these connotations is a definition of the goal as an external product which is structured and pre-defined. Another member, Yael (Y.) has reservations about the meaning of pre-defined product and time. They constitute a binary opposite of her connotation for the concept 'goal' which she understands as a process flexible in time and topic. A year later another member joined the community, Ela (El.), and the question about the group's goal came up once more. Ela uses the word 'definition' trying to explain the way she understands what is going on in the group as well as the group's goal (Table 1).

Ela: "I am asking why this community does not have a clear, explicit definition at all. Has there even been an attempt to define? Here you are analyzing a case study and here you are trying to develop a new theory, and here everyone is supposed to experience individual learning which leads also to the group learning"….

Shosh: … "the name of the game is ambiguity"…

Daliah and Noa: … "we don't want to set a goal (October, 2012)".

The new member is trying to comprehend the group definition out of concepts she has heard during the group discourse. Whereas Ela's connotation for 'goal' is `clear`, explicit and distinct, Shosh presents the binary opposite of these connotations, namely ambiguity and lack of definition (Table 2). By doing that, Shosh expands the meanings associated with 'goal'.

In the two discourse sessions described above the discourse community members concur about the concept 'goal' and this represents the 'equilibrium' prevalent in the community. This equilibrium was temporarily disrupted by the questions of the new members (Ness and Ela). However, it was restored by the positive feedback of the veteran discourse community members who advocated ambiguity during new knowledge building process. The veteran members' objection to define a goal is due to the connotations for product and time definition, which they perceive as stemming from an external source and not as growing from an internal process developing in the discourse.

Months later the concept 'goal' came up for discussion, and the author joined the discourse community. The author related to the concept 'goal' through the following connotations: a group voice, nature of the discourse and product.

Ilana (I): "What is the objective of this exercise? Does the goal mean defining the group voice? This is a concept which has not yet been defined, everyone views it differently…   Where is the individual within the group voice"?

Eti: "A new thing which had not existed before was formed and we don't have to define it. We should relate to it as to new…purpose… Each of us will perceive it differently… the number of interpretations is equal to the number of people… Even then the insights into the meanings are different. This process is the interesting point to bring something very private, see what happens to it during the interaction and then go back to the private. We don't have a linear process here which leads to some sort of a product. Every product becomes the beginning of the matter. When I'm talking about a group voice I refer to the

Connotations associated with - goal	Binary opposite
A personal interested being satisfied (S.)	A group to which people come from an external goal
An observation process leading to knowledge building (E, S.)	A pre defined, structured external product, time is defined (E.)
A process which is flexible in time and topic (Y.)	Pre-defined product, goal and time (Y.)

Table 1. Discussion of Discousse Community Memberd during May 2011 (phase 1)

Connotations associated with - goal	Binary opposite
An attempt to define, product (El.)	The group does not have a definition at all (El.)
An explicit, clear and clear - cut definition (El.)	Ambiguity
A case study, theory development (El.)	No goal (D, N.)

Table 2. Discussion of Discousse Community Members during May 2011 (phase 2)

common knowledge which we are building"…

Shosh: "And the outcome of the interaction is that this idea has increasingly grown and developed… and something new has been created… it is unexpected because I could not anticipate the contribution which each of us made. We all came with our own prism… The question underlying what we are doing: What is it good for? This is not merely an academic question… I want it to have validity… to conceptualize it…

I: I came today realizing that we did not receive any guidance regarding the purpose of the session… we come and things flow… Within this chaos to start seeing something… (February, 2013).

As a new member, author specified connotations which she believes are associated with the concept 'goal', for example, definition of a group voice, prediction ability and external guidance (Table 3). Conversely, Eti and Shosh indicate the connotation for a new and unexpected growth of knowledge as a result of the interaction during the discourse. Moreover, Eti avoids using the word 'goal' and uses the word 'purpose' rendering her connotation for the concept 'goal' distinguished from the connotation describing linearity which defines time and product and is determined by a factor outside the system. Eti grounds herself on her personal knowledge (Individual reality) regarding the importance of the individual in the group as an essential connotation for forming new knowledge, while perceiving knowledge in a different way and thus, contributes to the discourse interaction. Perceiving knowledge as individuals' personal knowledge, although it has grown out of the interaction in the group, is a new sign in the discourse which refers to the tension between personal knowledge (Individual reality) and group knowledge (Group reality). It was emphasized that, the new

knowledge is unexpected since one cannot assume each member's contribution to the building of knowledge.

A summary of the session which opened with the question regarding the discourse goal illustrates that the group is looking for something new, surprising and unexpected, emerging from a discourse interaction. The discourse transpired in a chaotic, nonlinear process, differently perceived by each individual in the group. It does not require a product; rather, its essence is a conceptualization of processes and ideas. In fact not all the members use the same connotations but they intensify the connotation for lack of product and time definition in the group by means of a positive feedback. For the first time the group has a negative feedback, disrupting the equilibrium nurtured by the members' positive feedback and acts as an Attractor in the group (Tables 4-7).

The topic of 'goal' remains on the discourse community agenda. It stands at the core of the discourse also in the following sessions and is an indicator of the group's characteristics, its conduct as well as topics which preoccupy its members.

Ela: "In my opinion there was some apprehension or need to be meaningful in the group… it bothered us… because we have no product… Writing a paper"…

Eti: "The question why the group is looking for a meaning

Connotations associated with - goal	Binary opposite
A need to be meaningful in the group (El.)	There is no product (El.)
Group existence, searching for a meaning (E.)	Will not exist as a community (E.)
A product, something concrete, a group meaning (El.)	We are only speaking (El.)
An intellectual interest (I.), existential need (E.), unexpected (S.)	External motive

Table 4. Discussion of Discousse Community Members during March 2013 (phase 1)

Connotations associated with - goal	Binary opposite
A concrete goal, product, organization (I., D.)	Meaning, depth, intention (S.)
Learn from the group discourse, implement in the field (I.)	Learn in the group
Fixed (I.)	Emerged (S.)
Quantitative pace, methodology (S.)	Ambiguity, uncertainty, interpretation

Table 5. Discussion of Discousse Community Members during March 2013 (phase 2)

Connotations associated with - goal	Binary opposite
The goal is to define (I.)	Was not defined, everyone sees it differently (I.)
Linear, leading to a product (I.)	Nonlinear, a process (E.)
External guidance (I.)	Internal goal (E.)
A process, interaction outcome - something new, (E., S.), unexpected (S.)	Expected, defined in time and product

Table 3. Discussion of Discousse Community Members during February 2013

– the reason it is afraid it will stop existing… Why is there a fear of not existing as a group"…

Ela: "There was some need that I will come out with something in my hand. Look, we are just talking"…

Shosh: "The need that I will come out and will be able to do something with it"…

I: "Everybody has something, an interest".

Eti: "There is a difference between need and interest. A deep existential need and an intellectual interest… They are overt and you can make them covert… We should discover a covert interest… (March , 2013)".

The continued discussion on the concept 'goal' raises new connotations such as meaning, need and interest. The need of each member to be meaningful in the group and the apprehension associated with the continued existence of the discourse community attest to its importance to its members. Nevertheless, at this stage, the connotation for 'goal' is expanded and it is described as a product, 'something in the hand' which will grow out of the discourse as an internal, existential need which emerges from the discourse interaction and can affect the continued existence of the community. The connotations raised in the discourse community for the concept 'goal' and their expansion to the range between a defined product (whose source is internal and it is determined by the members) and ambiguity (which enables development of an inner process) allowed author to implement in her realm of occupation what author had learnt in the discourse community. These connotations were reflected also by Daliah who copes with the issue of the 'goal' in her educational field of action.

I: … "interviews with my students evoke a very strong echo, namely what bothers them is something between a diffuse tutors with whom things are unclear, versus an organized, methodical, goal-oriented tutor… This is very similar to what is going on here… Is there any reason why you have decided there is no goal here"?

Daliah: … "I think that defining goals or not is connected to me".

Shosh: "You bring the example from that committee which has goals. I am asking about the group here".

Daliah: "The distinction between a group with goals and a group without goals. What is the meaning of not defining goals"?

I: …"According to what I see, the field is clamoring for goal definition but we want to generate some change. Do we ignore what the field is saying? Our goal in this group is to learn about us and do… in our field".

Shosh: "We work in the field and want to change… Why do people come? I. asked – "Does the fact that I have a goal undermine my ability to find a meaning? – I don't accept that… there is a difference between goal-oriented and not goal-oriented". This is a pace. When you have a goal, you want to accomplish it… give it some time".

Yael: … "Daliah said she wanted to talk about ambiguity… Eti said she wrote about ambiguity and uncertainty… Finally the members of Discourse Community realized that the topic of ambiguity or uncertainty is an inherent part of the type of learning which interests us…… knowledge building"…

Shosh: … "the teacher with the goals versus the teacher without the goals…… you start seeing a treasure of things. Out of them something new emerged (May, 2013)".

The author claimed that although concrete, product, order and organization are connotations define a concrete goal, they do not necessarily attest to lack of meaning, depth or intention. The author also indicated the learning from the group discourse and its implementation in the field as another connotation for the concept 'goal'. As a result, the relation between the group discourse and the practice in the field of activity came up for discussion, leading the connotations associated with pace and sticking to timetables as representing quantitative methodology, contrary to the discourse community's conduct whereby ambiguity and uncertainty are applied as a necessary part of the discourse development. The relation between the connotations ambiguity, uncertainty and learning is reinforced, inducing me to acknowledge their significance for a change process, learning and new growth of knowledge in authors work in the field vis-à-vis

student teachers. The discourse illustrated the link between the knowledge which grows in the discourse community (Group reality) and the options of its application in the field as part of author's personal knowledge (Individual reality).

The discussion during the session was another turning point which led to new connotations. Noa, who is an ecology specialist, describes the knowledge development process as resulting from chaos of interactions typical of Self Organizing Systems (SOS).

Noa: … "the notion of SOS indicates that we have a system here with components which maintain some equilibrium… there are all kinds of interaction options, but none of them has priority… when you unsettle the system, then for some reason you make it start operating… in many cases – when there is an increase to a higher order – one of the factors becomes an 'Attractor'… I. took the lead and told us: the issue of ambiguity bothers me a lot; she tried presenting examples from students working… and then Dalia joins in… many interests… in fact, the group develops out of the interactions between the interests rather than this supreme goal. That is, goals do not solve the ambiguity problem… development is the consequence of interactions… and out of the interaction new knowledge is born… someone pulls it in his direction… … people are mobilized to this topic because it concerns all of us… "

Shosh: … "the group in field, in which there is also a state of chaos and pulling to different directions… I, you should be the Attractor there too…… how did you interpret the group knowledge in order to activate your group… a much wider perception of the concept"… (July, 2013).

Noa's connotation for the concept 'goal' is an out-growth of an interaction between different interests in the group

which is feasible in a self-organizing system, stemming from states of ambiguity and thus facilitating creativity. This connotation is in contrast to a goal which is external to the group and blocks creativity (Table 6).

The members' consensus regarding the connotations for the concept 'goal' represents a temporary order, dynamic equilibrium which exists in the group and it is disrupted by an 'Attractor' who stimulants a conflict in the discourse community. The stimulated conflict was an opportunity for expanding the boundaries of the concept 'goal', while the interaction between the discourse community and the field allows implementation of the new knowledge which has grown in the discourse community also in favor of practice in the field.

The product associated with the concept 'goal' stemmed from the need to conceptualize the common knowledge which had grown in the group and whose source is internal, within the group (Table 7).

Noa: "We defined the group voice as jointly-built knowledge… To whom does the group voice belong? It belongs to all of us and we need to write about it together. Even if someone takes the lead, we share the conceptualization of the matter".

Daliah: "How did we miss it? Why didn't we write together? … It was an idea but we had never handled it".

I: "In this group where no goals are defined, can we do something like that? We create knowledge together. Everything belongs to everybody"…

Noa: "What happened in the previous session evoked new insights… those who have a special interpretation should write it down".

Shosh: … "the only assumption we accepted was that in this group we do not wish to set goals. I don't think that people act without goals… ambiguity embodies a

Connotations associated with – goal	Binary opposite
Growing out of interaction between different interests (N.)	The goal is external and is defined from the outside
Goal is a definition, curbing creativity (N.)	Ambiguity enables creativity (N.)
A goal is a consensus (N.)	An 'Attractor' (N.)
Groups interaction (S.)	Activity in the field
Wide perception of the concept, implementing the new knowledge in field	Reducing the concept

Table 6. Discussion of Discousse Community Members during July 2013

Connotations associated with - goal	Binary opposite
Jointly- build knowledge (N.)	Knowledge belong to members
Co - writing (N.)	Someone leads and everyone collaborates (N.)
Operates participants (S.)	Ambiguity - an operate challenge (S.)
Creating common concepts	Ambiguity - existence of opposite. perceptions

Table 7. Discussion of Discousse Community Members during October 2013

challenge and not only a threat".

Eti: "If changing a perception is an option, I can insert the opposite option into my thinking – this in my opinion is the ambiguity (October, 2013)".

The new connotations added to the sign 'goal' are writing, conceptualizing the new knowledge, changing the perception built out of the relations between the binary opposites which emerged in the discourse, ambiguity as a challenge by existence of a contrasting perception. For the first time the discussion enables expansion of the connotation for the concept 'goal' also to the conceptualization, writing and publishing of the knowledge growing in the group.

But, the process of changing the perception which transpired in the group and affected all the members 'within' the group was differently conceived by a new member, Sari, who came from outside the group. This is an opportunity to learn about the process of knowledge growth in the group from an ecological point of view which relates to observation from 'inside' and 'outside' the group.

Sari: "It does not seem to me this did something big for the group… its regular ritual – everyone who joins is naturally seeking the organized thing… but it does not affect the group…"

I: … "I think there is a difference between the answer given to Ness about this matter and the answer given to me…"

Yael: "The difference is essential… I think that in any case something has been added which is maybe a consequence of the group. The question is exactly the point that suddenly something comes up…"

Daliah: "A new member brings rethinking to the group … In the last session we definitely clarified the goal… how we can derive insights, new knowledge out of the discourse…"

Eti: "What we hear ourselves saying… what has happened… this is a development… this is the story of 'inside' and 'outside' (February, 2014)."

The new member, Sari, referred to the concept 'goal' as a connotation for something organized and considered the discussion as a regular, superficial and routine ritual,

typical of the process of new members joining the group and, therefore, it does not affect the group. Unlike her, the veteran members claimed that the difference in the discourse associated with the concept 'goal' has turned into something essential. It stemmed from a chaotic, nonlinear discourse, was thorough and even facilitated the emergence of insights and new knowledge. Moreover, the developmental group process reflects a dialogue between 'inside' and 'outside' as characterizes in ecological thinking.

Discussion

This qualitative research aimed to monitor emergent knowledge in a discourse group by tracking the development of the concept 'goal'. Based on 'semiotic evolution' methodology the analysis facilitates the description of interactions between personal perceptions and the group discourse, illustrating the change process and signs development.

As findings illustrate the definition of the concept goal was changed gradually during discourse. The first connotations of the concept goal were associated with external, time definition, and structured product which blocked creativity. During the discourse expanding connotations of the concept goal enable using different concepts such as internal, existential need, application in the field and affecting creativity.

This new knowledge which emerged following the discourse interaction was unexpected, surprising and it turned out as supporting the continuing viability of the discourse community.

Based on Posner (1982) who states that learning is a conceptual change process, we can carefully indicate on this changing concepts perceptions process as knowledge building. A generative knowledge is expressed in long term knowledge retention, knowledge understanding and active knowledge while improving cognitive flexibility (Posner, Strike, Hewson, & Gertzog, 1982).

This was expressed in the author's conduct in the field of activity towards more constructive leadership: The author revealed tolerance to situations of ambiguity and

uncertainty, allowed in-service and pre-service teachers to take part in the organization of the new setup of the partnership as well as encouraged freedom of speech and creativity of all the members. At the same time a change transpired also in the discourse community. We decided to conceptualize the knowledge acquired in the group and to summarize the insights in a written product.

What were the factors that enable this knowledge growth in the discourse community? Analysis of the discourse indicates three factors which support the growth of the new knowledge: a. negative feedback in the discourse as an Attractor; b. leadership in the discourse community; c. interaction between different interests of the discourse community members.

Negative Feedback in the Discourse as an Attractor

Group flexibility and openness to a variety of new ideas allowed the new participants to express opinions contrary to those accepted in the group, acting as negative feedback which temporarily impaired balance, and enabled the veteran members to re-clarify their attitude. Author's words also undermined the balance in the group, but acted as Attractor (Simon, 2002; Sterman, 1994) as they echoed among other community members, and undermined the equilibrium in the group.   The entire process was facilitated due to the leadership in the discourse community and to interests' interaction between participants.

Leadership in the Discourse Community

The leadership in the discourse community enabled chaotic, nonlinear conduct which encouraged flow of time and information. This was manifested by flexibility to a new personal and professional experience and reflected on tolerance for different perspectives discussed by community members and on sharing responsibility (Diotaiuti, Marco-Zona, & Rea, 2015; Paul, 1990; Ronen, 2015).

The group in which the advisor had no exclusivity on agenda setting enabled one of the participants, Eti, to reflect the importance of hearing my voice, despite being contrary to the spirit of the group, contrary to the experience of ambiguity in which she believes, and contrary to her personal knowledge itself. This interaction between group members led to a new direction, as the group was spontaneously reorganized (Self organizing system), without leader intervention.

This manifests the power of a constructivist instruction in a group, whereby the leader's role changes according to events rather to a formal position (Mitchell & Sackney, 2009). A leader of a learning community who accepts the constructivist position is required to provide learners with the opportunity to   construct their own world while interacting with sensory data, and   understanding the world. This helps them create their own connotations to understand the world, which is also important in every teaching-learning process.

Such progression might allow growth and development of an emergent knowledge and behavior which were complex (Posner, et al., 1982) and led to implementing author's insights in my field of work. Discourse analysis also showed the importance of the interaction between various interests of the discourse community participants to discourse development.

Interaction Between Different Interests of the Discourse Community Members

Interaction between the different interests of the discourse community members was a motivating factor for Self Organizing System (Bereiter, 2002; Goldenfeld & Kadanoff, 1999; Kauffman, 1993; Simon, 2002), in the discourse community, enabling knowledge emergence (Perkins, 2000). Although the concept 'goal' was placed on the discourse agenda due to a difficulty encountered in the author's field of practice, it met other members` interests, when Daliah also came across issues associated with 'goal' in her field work. This common interest was relevant to Noa who brought to the discourse her own knowledge regarding self-organizing systems, whereby the discourse develops due to interaction between interests which constitutes the stimulus for change and learning. Eti coped with the challenge and initiated the necessity to enable expression of different voices, meeting her interest as an organizational counsellor. Finally, Shosh identified in the process an opportunity for

conceptualizing the process as a conceptual change which author experienced in her field of activity outside the discourse community. Indeed, during the process of clarifying the question of the way knowledge grows, we experienced the interaction between the members' different interests and the growth of knowledge on a personal and group level, as cited by Peirce (1960):

… but we already know that a person is alone and incomplete, that he is by chance a potential member of society and that in a unique way, a person's experience is nothing if it is not shared with other people. It is not my experience but our experiences which should be investigated and this 'our' has infinite options (5/402).

Limitations

The researcher was the one who defined and analyzed the discourse. This ethical issue was resolved by means of the researcher's ongoing consultation with an expert on the analysis based on semiotic evolution. They participated in the reading, classification and defining the connotations and binary opposites emerged from the discourses over time and in the discussion of the conclusions that arose from an analysis of the findings. The study is based on discourse group which is not typical in school learning – teaching process; therefore its insight should be carefully customized when implemented in teaching and Teacher Education.

Practical Implementation and Recommendation

In spite of the differences between a discourse group and classroom the insights about the factors supporting emergent knowledge can also be useful while implemented in various Educational frameworks and during teacher training. Adopting discourse group behavior such as encouraging flow of time and information; allowing openness to a variety of new and even contrary ideas as an attractor; encouraging tolerance for ambiguity situations during interaction between different interests; sharing responsibility via constructivist leadership can become fertile ground to factors that empower the growth of knowledge.

Conclusion

Investigating the knowledge growth process of the concept 'goal', has been done using semiotic evolution methodology. The methodology enabled tracking changes and expanding boundaries of the concept`s connotations towards emergent knowledge. The discourse community members faced a self-organizing group which enabled free and nonlinear interaction and encouraged sharing responsibility for learning.

Based on the discourse community interactions three factors suggested as supporting emergent knowledge were pointed: a. negative feedback in the discourse as an attractor in the discourse; b. constructivist leadership in the discourse community; c. interaction between different interests of the discourse community members.

The discourse group behavior can be adopted in teaching - learning proses in spite of noticeable organizational and cultural differences between a discourse group and classroom, like: number of participants, time limits, subject matter definition, internal motivation and aims setting.

Further study is required to examine the conditions that will allow the implementation of the research findings in teaching and teacher education aiming a knowledge growth on a personal and group level.

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