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“To Teach Learning…” or on the Culture of Thinking of Today’s Students

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Abstract

This article addresses a challenge of forming the culture of thinking in the learners. It demonstrates that an indicator of the progress of this quality is the students’ ability to operate strings of inferences and to build a conceptual semantic web. The article considers outcomes of teaching classes with a use of a compound approach, that is, a combination of an interactive lecture and a heuristic conversation. Analysis of the outcomes was effected through a questionnaire survey with a subsequent interpretation of the outcomes by means of building a conceptual semantic web that the student had formed upon completion of the cycle of classes. The findings were analyzed from the viewpoint of the clip thinking concept and the “oversimplified mind” concept.

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1. Introduction

Relevance of the task to enhance the educational process’ quality has especially increased in recent times, when the existing system was condemned as inadequate and a decision was made on the necessity to change the educational paradigm switching from knowledge and skills to competences. Nevertheless, fundamental truths remain effective. One of such truths is expressed by the maxima: the goal of the higher education is not in transferring particular knowledge but in teaching a student to learn. The challenge of “teaching to learn…” cannot

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be met without forming a culture of thinking in a student. The above also remains valid in new educational paradigm based on competencies: for instance, the Federal State Educational Standard FSES-3, standard requirements for bachelor’s degree of management directly sets a goal of mastering the culture of thinking. Similar statements can be found in other education standards (FGOS-3, 2010) for bachelor’s degree of other directions.

Comprehension of what the culture of thinking is would be inseparable from the substantive interpretation of the process of thinking. According to the classical idea, human thinking proceeds in a form of judgments and inferences. A judgment is a form of thinking that reflects objects of reality in their connections and relations. Every judgment is a separate thought about something or other. A consistent logical connection between a number of judgments required for addressing reflective tasks, realize something, or find an answer to a question is called a reasoning. A reasoning is of a practical importance only when it leads to a certain conclusion or an inference. The inference will be that answer to the question, an outcome of the search for a thought. An inference is a conclusion derived out of several judgments that gives us new knowledge about items and events of the objectified world (Getmanova, 1995). On this basis, it can be assumed that the culture of thinking is, above all, an ability to construct reasoning, that is, sequential strings of inferences.

It is unlikely for us to know reliably how the actual inferences process proceeds, but the ultimate form of the presentation of the thinking process outcomes is well known. Specialists in cognitive psychology maintain that the semantic web demonstrated on Fig. 1 is the formalized type of the knowledge presentation.

Thus, R. Solso (2006) calls the semantic web a method to “represent knowledge” and B.M. Velichkovskiy (2006) calls it a way to “categorize knowledge”. A standard of ontological simulation of IDEF5 application domain that is similarly based on the semantic web is also known (IDEF5 Method Report, 1994). In any case, an existence of the direct correlation between the presence of the culture of thinking and the ability to operate the conceptual semantic web may be assumed.

Therefore, assessing the student's ability to build a conceptual semantic web, we appreciate its culture of thinking. This is the subject matter addressed by this article. Next will be described the author's method to perform such an assessment.
2. Method

Evaluation of the culture of thinking, i.e. the learner’s skill to construct long strings of inferences, requires two components: a pedagogical methodology focusing a student on reasoning and a result-capturing methodology. A complex teaching methods were selected, namely an interactive lecture combined with a heuristic conversation. “Heuristic conversation” is the term of the Russian pedagogical tradition. This method is often called teaching with discussions. The heuristic conversation as a requisite component of the teaching process is implemented because, in a methodological sense, a heuristic conversation ascends to the maieutics – the “midwife art” of Socrates. It is well known that Socrates himself claimed that in the conversation process he helps to discover the truth, just as a midwife merely helps the baby to be born. According to the opinion of B.A. Vogt (2000), the method of Socrates is based on the following methodological positions. First, a teacher and a student find an accord in the common discussion subject, while in a dialogue. Second, the conversation partners discover in various cases those common points that are determinants for the particulars, i.e. come to the determination of concepts. Third, in a course of the dialogue, an internal criterion of the verity of the emerging thought is implemented, that is, a checking is made whether the thought that has occurred agrees with itself and with its own consequences or not; as a result, the objects research, i.e. cognition and learning, progresses on the basis of the actual objects instead of their outer reflection. All above mentioned is, in fact, the process of construction of the inferences string, i.e. reasoning.

Results capturing of heuristic conversation was effected by means of a questionnaire survey. The questionnaire assignment was phrased as follows: to describe in a free-form way the progress of a discussion that was going on throughout the classes’ cycle. When phrasing the assignment, the major focus was made on the description of the discussion holding that can not be done without building the appropriate semantic web. For the particular implementation of all of the above, the students underwent 8 academic hours of classes in “Theory of Sustainable City Development” subject lectured by the author (Gushchin, 2015). The period of 8 academic hours was chosen for this cycle because students find it important to be within one certain notional context. In the opinion of the author, the described approach is hard to use throughout the entire semester, as the material would need to be divided into several notional parts.

3. Results

Out of the surveys submitted by the entire group, three most typical ones were selected. Here they are below.

Survey №1:

The city and the sustainable development.

A city is a notion that in different countries falls under administrative entities that vary in terms of the number of population. The number of population in the cities ranges from 100 to 50,000 persons (a nominal requirement).

The features of a city are:

- Closed nature – one whole settlement, a self-contained system of life support.
- Population density – buildings are heavily populated and located close to each other.
- A specific style of life, dwellers hardly know each other.
- Existence of a market.
- A non-agricultural characteristic of occupations. Population of a city pursues trades and industry (mainly).
- An educational centre.
- A transportation hub.
- An administrative centre.

Sustainable development of the city relates to the necessity to increase the labor productivity. The labor productivity increase imposes a necessity to develop technologies. A necessity of technologies development entails an increase of risks and, therefore, formation of a risk society.

The urban lifestyle gives a person more free time that enables the city dwellers to develop:

- in a creative way,
- educational opportunity,
- to be engaged in public activities.

With a city development, risks inevitably occur.
The response was accompanied with a graphic diagram that describes the general progress of the discussion and is executed by the respondent. The diagram is presented at Fig. 2 below.

![Figure 2](image)

Let us highlight the most interesting points of this description. First, there is a headline, that is, the author’s thought is brought under the overall logic. Second, existence of reference definition. Third, existence of a graphic diagram that reflects the discussion progress. Fourth, the author uses uniform connections between the notions, that is, every arrow can be marked “determines” (the respondents intuitively uses methods of constructing a semantic web). The presence of these points proves the existence of a developed culture of thinking of the student who wrote the survey №1 and truly confirms our assumptions that the culture of thinking is characterized by the ability to build a of the inferences string. This is the best example of all surveys.

Survey №2:

After having listened to the lectures on TSCD (Theory of Sustainable City Development), I arrived at a conclusion that development of the urban environment led to the release of time. But not many people learned to use this time. Development of technologies led to the overall laziness of the mankind. Appearance of Internet has a two-fold meaning. People who live in a village strive for the city, and people who live in a city – for the village... A paradox! I belong to the second half. Development in the future has an interesting component underneath. I wonder if we will participate in it or follow the river flow? I always try to do something while doing something else. For example: when chowing I handle matters over the phone, when I go to work I plan what I am going to do after it and how to plan it so that I don’t have to waste time for back-and-forth-going. It is enjoyable, even. How did people manage to make arrangements without a telephone before??? And we compare ourselves with rural life. To survive there without everything that exists in the city – that’s the power of the human spirit. And only by starting at the lowest stages of progress (if a person is forced into it since childhood), true work addicts can be raised.

In this text, we have an example of a so-called “common knowledge” (Ruzavin, 1975) which is demonstrated by the following characteristic peculiarities of the text: the representation starts with the formulation of the general empiric generalization that development of technologies led to the “overall laziness of the mankind”.

Then an attempt is made to elaborate on this statement by countering the city and the countryside, and afterwards the author’s associations pass into the sphere of the author’s practical personal experience.

Survey №3:

By contemplating the sustainable development in reality you notice that if you take a country dweller and an urban one, the difference will be that the urban dweller is by many times educable developable and attempting for accomplishing something new, and the rural dweller is more retarded, afraid to grasp new
technologies and retired into the old technologies, traditions, rites, etc.
Based on the stated above, for development in the future an urban dweller will feel comfortable and interested and the rural one – contrarily. This is the conclusion out of the subject learnt that I have formed!!

It is remarkable that the author of this survey has taken an active part directly in the conversation process, which demonstrates that a direct correlation does not necessarily exist between participation in the educational process and knowledge obtained. In the survey, all inferences reduce to a single empiric conclusion, although an attempt is made to substantiate the empiric conclusion somehow.

4. Outcomes analysis and discussion
We shall try to reconstruct the conceptual semantic web for Survey №2.

Assumed concepts at Fig. 3 and 4 are marked with dotted lines. It is clear that, compared to the Figure 2 (Survey №1), the conceptual semantic web is less complete and contains implied concepts that consist a basis for the further empiric conclusions. What is the result of “common knowledge”, typical for the student who wrote survey №2. Common knowledge because of its universality prevents the formation of a full-fledged semantic web. The key difference between Surveys №1 and №2 is that in Survey №1 first a definition of the concepts of a “city” is made and then a string of reasoning is constructed, thus enabling to retain the representation logic, while in Survey №2 the string of reasoning is constructed first, leading to the implicit contraposition of “mankind” and “I” that is resolved in the form of a question “Do I know how to use time?”. Then an attempt is made to turn the reasoning back to the subject’s context.

We shall conduct a similar reconstruction for Survey №3. The reconstruction is presented at Figure 4 below. As the reconstruction demonstrates, the semantic web is simplified even further, contains less of explicitly (on a logical level) formalized concepts and more of implicit (implied) concepts. The zero point is the determination of concepts “urban dweller” vs. “rural dweller” revealed through their mutual contraposition. Subsequently, the entire reasoning string is formed based on the implicit assumptions.

Thus, if one were to evaluate the culture of thinking, the highest points can be given to Survey №1. Other surveys, in the author’s opinion, can be evaluated as satisfactory and unsatisfactory, although it would do the surveys’ authors good to learn the material and answer the questions. The second conclusion that should be made is that formation of the culture of thinking is an extensive process that is impossible within the scope of one study course or one discipline. Third, the presented survey as a whole confirms the assumption that the sign of a culture of thinking is the ability to operate with the inferences string and present it in the form of a semantic web.
What factors can explain this state of things, i.e. inability of students to operate with the inferences string? One of the factors is the impact of the information society. The information society’s impact on the human thinking is noticeable in the clip thinking concept. The term “clip thinking” for the first time appeared in the publications of American futurologist A. Toffler as a fundamentally new phenomenon that is considered as a component of the overall information culture of the future (Toffler, 2002). The impact of informatization on the students’ psyche is described in the publication by A.S. Faustov and Y.V. Sheherbatykh dated 2000. K.G. Frumkin (2010) characterizes the clip thinking as follows: “The essence of the clip thinking is that it is able – and likes – to switch between disconnected notional fragments. The key advantage of the “clip perception” is a high speed of the information processing. Another peculiarity of it is the preference of non-textual, pictorial information” (Frumkin, 2010). The reckoning for the clip character of thinking is this. “The down-side of the clip thinking that requires virtuosity and reactivity of sorts is the inability to perceive an extensive linear sequence such as homogeneous and single-type information, including a book text” (Frumkin, 2010). Within the concept of the clip thinking many authors emphasize that the clip thinking in itself does not hinder the educational process, one merely needs to choose the relevant methods carefully.

Perhaps, it is the clip thinking impact that can explain the inability to concentrate on some particular sequence of judgements that shows in Surveys №2 and №3. However, the clip thinking concept highlights the text perception, while other linear actions would be performed successively and for a long time. Quoting K.G. Frumkin, “A well-known blogger recited: “I recalled seeing some guys playing computer games. Between the episodes, there were two or three screen-lengths of a text describing the intricately worded dealings of some hero with local kings – how he received something away from someone and insulted someone else, and they gathered an army, marched off, crossed a desert on the way... Before I had time to finish reading, the guys scrolled the screen down. They read three pages in a glance while I was still assembling the first lines in my head. They were looking for a key. They did not need to read this children’s fairytale, as they were familiar with this type of a game and knew that they are supposed to extract an instruction out of this whole text as to what object the hero must seize at the game’s next stage” (K.G. Frumkin, 2010). Therefore, the presence of the clip thinking does not hinder the game participants from performing a long linear sequence of manipulations in a computer game. For the same reason, it would not be quite correct to attribute the inability for judgements consisting of inference strings to the clip type of thinking either.
Yet another prospective concept to explain the outcomes observed is the concept of the “oversimplified mind”. We owe the term “oversimplified mind” to the marketing guru Jack Trout who introduced it in the context of his ideas concerning the merchandise positioning. According to Trout, “oversimplified mind” is a protective reaction of a person to the contemporary world that is over-packed with communications of various kinds. Jack Trout provides impressive examples of the over-infusion with information: “Take books. Each year some 30,000 books are published in America. Every year another 30,000. Which doesn’t sound like a lot until you realize it would take 17 years of reading 24 hours a day just to finish one year’s output. Who can keep up? Take newspapers. Each year American newspapers use more than 10 million tons of newsprint. Which means that the average person consumes 94 pounds of newsprint a year. There’s some question whether the average person can digest all this information. The Sunday edition of a large metropolitan newspaper like *The New York Times* weighs about 4½ pounds and contains some 500,000 words. To read it all, at an average reading speed of 300 words per minute, would take almost 28 hours. Not only would your Sunday be shot, but also a good part of the rest of the week too.” (Ries & Trout, 2001, p. 8).

The response to the external environment over-infused with information is to develop a specific defense mechanism Trout has named an “oversimplified mind” (“over-simple mind” in the Russian translation). “The only defense a person has in our overcommunicated society is an oversimplified mind”. “The mind, as a defence against the volume of today’s communications, screens and rejects much of the information offered it. In general, the mind accepts only that which matches prior knowledge or experience” (Ries & Trout, 2001, p. 7). The “oversimplified mind” concept highlights the resistance, that is, the capacity to resist an inflow of new information. In chapter “Those Little Ladders in Your Head” of the book quoted above, Ries and Trout point out: “The mind plays a role of a mechanism protecting against excessive volume of modern communications and rejects whatever information it cannot compute. It accepts only such new information that is matching its current state of mind. Everything else is filtered out” (Ries & Trout, 2001, p. 8). The second protective property is the tendency to simplify: “To handle complexity, people learned to simplify all and sundry” (Ries & Trout, 2001, p. 5).

Two properties stated above are quite capable of explaining specifics of the conceptual semantic web demonstrated in Surveys \( \forall 2 \) and \( \forall 3 \). Resistance to the perception of new information can account for the reliance on the “common knowledge” which is clearly seen in the reconstructions (Figures 3 and 4). Finally, the tendency to simplify perfectly justifies the scarceness of the conceptual semantic web. Although, strictly speaking, it would not be rightful to consider the informational overcommunicated society the sole barrier on the way of forming the culture of thinking, as there is no reliable data regarding the times of the non-informational society available.

However, from then on, the aims of a marketing specialist governed by the “oversimplified mind” concept and a pedagogue governed by the same concept become radically opposite. Where the marketing specialist sees their task in creation of “oversimplified messages” that would sink into the common mind’s level, the pedagogue sees their task in the opposite – i.e., to form in the students such culture of thinking that would enable them to operate the complex conceptual semantic web.

By which means can the culture of thinking be formed? One of the methods is described above – namely, a heuristic conversation. The author's experience in implementation of the ontological simulation standard in the teaching of “Databases” course can also be considered successful. As the attention is drawn to the problem, other means shall also occur.

5. Conclusion
This article addresses a challenge of forming the culture of thinking in the learners. An indicator of the progress of this quality is the students’ ability to operate strings of inferences and to build a conceptual semantic web. A compound method is used as a methodology for a formation of the culture of thinking, that is, a combination of an interactive lecture and a heuristic conversation. To assess the completeness of the culture of thinking, a questionnaire survey is used and the findings are analyzed. It demonstrates that the “oversimplified mind” concept is best suited for the outcomes interpretation.

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