

## DIGITAL INTERMEDIATION, INTERNET USAGE AND THE DEVELOPMENT OF COGNITIVE STYLES

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**Abstract.** *Application of information and communication technologies in education has changed not only the forms of organization of educational process but also the way students learn. Studies over the last decade have shown that availability of the internet has changed the way students search, perceive, remember and assimilate new information and knowledge. This paper uses the works of cultural-historical psychology, media studies and cognitive psychology to ground the idea that the use of the media affects the development of cognitive styles. Computer technologies are conceptualized as cultural means, as psychological tools and new forms of intermediation between the consciousness and productive activity. As such, computer technologies and specifically the internet have the potential of influencing the development of higher psychic functions, the forms of cognitive self-control and self-government. The paper discusses the application of Sternberg's conception of thinking styles to the problems of the influence of computer technologies on the development of styles of cognitive self-control. As empirical evidence the paper uses the materials of five focus group discussions with school and university teachers conducted within the project "The impact of internet usage patterns on the development of youth's cognitive styles".*

**Keywords:** *cognitive styles, digital technologies, intermediation, internet, students*

### Introduction

Computer technologies and the internet have afforded new opportunities for organization of the learning process in education institutions and for students' independent learning. These developments in education are part of more general societal transformations brought about by information and communication technologies which have affected many other domains of human activity. Computer technologies and the internet have changed the way people connect with each other, how they work, how they entertain, how they participate in communal life and politics, and, of course, how they acquire new information and learn (Castells, 2001; Van Dijk, 2020). These changes have been fundamental and the internet has been recognized as a 'transformative technology' (Graham, 2000; Bücher, Hergesell, & Kallinikos, 2022). For the students and pupils the computer technologies provide a socialization environment and generally the computer serves as a "cultural interface" (Manovich, 2001) through which they perceive the world. The internet has empowered the students in their activities of self-directed learning.

In the field of education psychology, research has been done on effective methods of online education (Nilson & Goodson, 2018). There have been studies on how the use of the internet has influenced some cognitive faculties of the students, for example, memorizing and problem-solving (Sparrow & Chatman, 2013). There have been studies on perception, attention and reading in the online environment (Baron, 2008; Carr, 2020). Much attention has been paid to the study of online communication and socialization. But providing a more comprehensive model of the influence of the internet on cognitive development still remains a challenge. This paper sets forth the main ideas of the theoretical approach elaborated in the project “The impact of internet usage patterns on the development of youth’s cognitive styles”. It applies the conception of cognitive styles by Robert Sternberg and combines it with the insights from cultural-historical psychology founded by Lev Vygotsky. The common ground of these conceptions is the idea of self-government, or mastering of one’s psychic processes and behaviour, which is formed in the course of an individual’s psychological development. According to Vygotsky, the higher psychological functions develop in course of maturation of cognitive control of the individual over his or her psychological faculties and behaviour. According to Sternberg, individuals differ in the forms of their psychological self-control, or self-government. They develop different cognitive, or thinking styles. Sternberg classifies these thinking styles using the metaphor of the functions and forms of political government (legislative, judicial, executive etc.). These forms of individual self-government are relatively autonomous from cognitive abilities. Sternberg’s concept of thinking styles complements Vygotsky’s theory by adding variability to the outcomes of psychological and cognitive development. But Vygotsky’s theory is helpful in providing conceptual tools for explaining cognitive development by employment of cultural means of intermediation, which the individuals are mastering through socialization and learning.

This paper lays out the concept of digital intermediation by interpreting the ideas from cultural-historical psychology for the purpose of the study of the influence of the internet on psychological development of youth. It interprets the information technologies and digital media as a novel form of psychological intermediation. It sets out to show how the concept of cognitive styles can be applied in the study of the effects of the use of the internet on cognitive development and learning. On the basis of focus group discussions with school and university teachers it discusses how the use of the internet can foster the formation of particular thinking styles in terms of Sternberg’s theory.

### **Intermediation, psychological tools and cognitive development**

The starting point of cultural-historical theory is the idea that the essential mechanism of human psychic development is the introduction of a system of

artificial stimuli which help the humans to master their own behavior (Vygotskij, 1984b, p. 77). The system of such artificial stimuli at the stage of the childhood is speech (Vygotskij, 1984b, p. 80). The individual is mastering himself or herself with the help of external means, the 'psychological tools', which are directed on one's psyche and behaviour. The word, the language is crucial in psychological and cognitive development because they enable one to generalize the experience, to analyze and to learn the experience of other humans. The *word* becomes the means for the development of conceptual thinking, which, according to Vygotsky, plays the central role for other psychic functions, such as attention, memory, perception and will (Vygotskij, 1984a). The development of conceptual thinking, which evolves through several stages, is the central process in overall psychic development during childhood and adolescence (Vygotskij, 1983). It is important to emphasize that the human psychological development becomes possible thanks to the existence of cultural objects, which have a history. Psychological development, according to cultural-historical psychology, has the direction from the external toward the internal, from inter-psychic toward intra-psychic (Vygotskij, 1982, p. 130). The major tools of individual psychological development are cultural means and objects shared by the community. Therefore, the concept of *intermediation* (*oposredstvovanie*) is crucial for understanding psychological development in the perspective of cultural-historical psychology. Luria and Leontiev further elaborated on the role and significance of language for the functioning of consciousness. Language, according to Luria, is the chief means of conscious activity of the humans (Lurija, 1979, p. 50). Language supports consciousness and thinking, it mediates one's operations with the objects of practical work and the relationships with other humans (Leontiev, 1981).

The general postulates of cultural-historical psychology may be correct. But language itself develops along with the technical means which are employed to make use of the language as a psychological tool – *the technical means of intermediation*. Cultural-historical psychology has not paid sufficient attention to the study of the effects of technological development of linguistic media on the formaton of cognitive functions in historical perspective. This gap can be filled to some extent with the studies in linguistics and media. Oral speech is common to all humans and in this sense may be said to be 'natural' to human species. But writing is indeed a wholly technical, artificial invention, which not all languages possess (Ong, 2002, p. 81). Social anthropologist Goody provided evidence on the influence of writing on restructuring of social institutions, such as religion, law and economy (Goody, 1986). Writing, according to Goody, encourages decontextualization of speech and abstraction in thinking (Goody, 1986, p. 12). Invention of writing had a fundamental impact on the development of the capacity of reasoning (Goody, 1986, p. 142). It permits subsequent checking, control and reviewing of statements – the 'backward scanning' – and therefore subjects thinking process to a greater discipline. It fosters greater coherence and reflexivity

of the thinking process. Therefore, humans develop their cognitive capacity not just by using the speech as a ‘prop’, but also by using the technical means such as writing for this purpose. Writing, Ong suggests, is essentially a consciousness-raising activity (Ong, 2002, p. 147). The invention of printing further strengthened the effects of writing. The social and psychological implications of printing were explored in the works of McLuhan. Printing, according to McLuhan, made the sense of sight especially salient for humans, ‘separating’ it from other senses and promoting the orderliness of perception. It encouraged the process of individualization, because greater access to books and the practice of reading brought about greater differentiation among people; their memories became more individualized. Reading fostered the development of greater “detachment” from the world and the attitude of objectivity (McLuhan, 1962, p. 87). Printing maximized the sense of closure of the text, its coherence and gave rise to new forms of creativity and artistic genres, such as novels (Ong, 2002, p. 156). Ong goes as far as to say that complex, ‘round’ human character is a creation of writing and printing culture (Ong, 2002, p. 148). Literary culture produced the concept of a complex human personality and a human lifeworld (Ong, 2002, p. 151).

The rapid development of broadcasting and later electronic media in the 20th century also have had significant social and psychological consequences. McLuhan was among the first scholars to explore these consequences. For example, McLuhan argued that radio has the effect of involving the individual lives of the people into the communal life, the public domain (McLuhan, 1994, p. 298). The TV has had the effect of simultaneous engagement the senses of hearing and sight in the moving images of the screen. Whereas printing promoted individualism, the broadcasting fostered greater cognitive and emotional involvement of the individuals in the common life of the society on local or global levels (McLuhan, 1994, p. 178).

### **Digital intermediation and the internet**

Digital technologies and the internet have had transformational effects on culture and society. As a form of intellectual technologies and a particular kind of intermediation they have affected also cognitive processes. The essence of the process of digitization is that it divides the analogue sources and information into digits – combinations of ones and zeros. This is performed by computer processors, the software and applications. Digitization enables the convergence of all media, especially with the appearance of broadband internet connection (Van Dijk, 2020, p. 66). Originally, the internet was designed as a technology for knowledge sharing (Berners-Lee, 2000, p. 200). But it grew rapidly into an unprecedentedly multifunctional medium. The internet now fulfils various functions for the users: information, communication, transaction, sociability, education and identity building (Van Dijk, 2020, p. 213). Introduction of mobile

digital devices increased permeation of the internet in everyday life. The internet is accessed by using mobile phones, laptop computers and other devices.

As a medium with the screen networked computers may be said to have a similar effect as the TV, that is, they involve several senses simultaneously. But the networked computer is an even more involving medium due to the interactivity of the internet. The user can communicate with other users, send them messages, share text and audio files, images and videos. The functions of work, learning, entertainment and sociality can be performed on a single device of a portable computer or a smartphone.

The social and economic effects of these technologies are numerous. One of the major social effects of the internet is that it empowers the individual to perform the abovementioned functions exercising more choice and control (Amichai-Hamburger, 2017). In other words, the internet intensifies the trend of individualization. This pertains to different domains of individual's experience, from work and learning to intimate relationships. Another major effect is that the use of computers and digital technologies have led to steep increase of production of data and information. This has produced a side effect of information and communication overload (Van Dijk, 2020).

Digital technologies have provided the students with many new opportunities. The networked computers allow for employment of different channels of perception (audiovisual, iconic, textual) and modes of learning (instruction, enaction, participation). There appeared new opportunities for students' self-directed learning. Students have more possibilities to manipulate with the subject matter themselves, to learn by exploring and experimenting, to choose from several types of presentation, to 'play' with the study material, its visualization and simulation, to engage with the dialogue with the 'intelligent' study software (Van Dijk, 2020, p. 42). There are more possibilities to connect with the teachers and fellow students and for distance learning. The internet with its structure of hyperlinks has provided more possibilities for 'associative learning'. The internet search engines allow for quick search of information in different formats. The combination of these new opportunities has led to the unprecedented transformation of the education system and practice (Ibid).

But the use of digital technologies in the learning process has posed also risks and led to undesirable consequences. Information overload often leads the users to employ the strategies of selective perception and scanning (Van Dijk, 2020, p. 200). This results in superficial assimilation of information and shallowness of perception. The students get used to quick reading of selected fragments which apparently satisfies their needs and solves posed tasks but they may fail to develop the skills for deep reading. It becomes increasingly difficult to motivate the students to read whole books or long articles (Baron, 2008). The students often recourse to 'snippet reading' (Ibid). When reading on the internet the students may 'jump' to the inbuilt hyperlinks and lose the meaning of the text

they had been reading. The risk here is the loss of coherence in the process of learning and acquiring knowledge (Levy, 2001; Carr, 2020). Quick reading without deep concentration also causes problems with memorizing the content. Students may assume that memorizing big volumes of information is not necessary when it can be quickly found on the internet – the strategy known as cognitive offloading. But this strategy is risky because the students may fail to establish enduring conceptual connections in their thinking which is necessary in the process of deep learning and getting understanding of study subjects. It should be pointed out that the problem of fragmentation of knowledge is not just a matter of particular forms of perception and learning habits. It has its basis in the digital technology itself which implies dividing information into discrete bytes. This allows for its easy manipulability and recombination. These opportunities for creating new cultural objects, including texts, have changed the parameters of culture itself (Manovich, 2001; Miller, 2020). Texts, for example, tend to acquire a ‘pointed structure’, containing combined and recombined layers and fragments (Van Dijk, 2020, p. 193). Manovich has argued that in the digital culture there is an erosion of the coherent narrative as a cultural form and it tends to be replaced by the database (Manovich, 2001).

The internet culture has affected the language and brought about the rise of a particular form of language known as ‘Netspeak’ (Crystal, 2001, p. 238). It is characterized by informality, use of abbreviations, laxity in observing grammar rules, especially punctuations, use of symbols of expressions of emotions and attitude and a number of specific stylistic features. This form of language is used by the young people mostly in the context of online chats and instant messages but it has a ‘spillover’ effect on other domains of linguistic usage.

Lastly, digital technologies have provided more possibilities for ‘multitasking’. Digital convergence of media and internet connectivity enabled performing various tasks simultaneously or nearly so. In practice, a student may work, engage in communication and visit entertainment sites at the same time. Multitasking creates the problem of distraction, lack of concentration and loss of focus (Gazzaley & Rosen, 2016). This is recognized as a problem for studying, because memorizing, bringing the information into the long-term memory requires focused attention. This is especially challenging for the youth because their cognitive control is not yet fully mature and digital devices represent tempting attractions for them.

### **Cognitive styles**

Sternberg put forward his theory of thinking styles in order to provide, from the point of view of psychology, an account for the differences in practical application of mental abilities of the individuals. People differ in the ways they prefer to make use of their cognitive abilities. He chose the metaphor of forms

and functions of the political government to describe the various ways in which individuals act while solving problems. While Sternberg's statement that forms of government are external reflections of what goes in people's minds (Sternberg, 1997, p. 17) is rather naive, the basic idea that people exercise a capacity for self-government, or self-control, is correct. This is taken as a fundamental human characteristic also in other psychological and sociological theories, for example by Lev Vygotsky and Norbert Elias (Elias, 2001), because humans possess the unique capacity to change, modify and transform their reactions to the external and internal stimuli. Sternberg's theory sets out to go farther by providing a typology of thinking styles according to the operations of societal government. These styles may be interpreted, from the point of view of the theories of Vygotsky and Elias, as particular and individualized ways of internalization of the constraints of social environment and intellectual procedures.

There are thinking styles which correspond to the functions of mental self-government: legislative, executive and judicial. *Legislative* people are those who like to determine their course of action, to create their own rules and prefer to deal with problems which are not prestructured. They tend to choose creating occupations (Sternberg, 1997, p. 20). *Executive* people like to solve given, prefabricated problems, to fill the gaps in the existing structures. They like to fulfil the plans rather than create the plans. *Judicial* people like to deal with problems by evaluating, judging and criticizing existing things, procedures and ideas. These people tend to choose occupations in which one can evaluate and analyze (Sternberg, 1997, p. 21).

There are thinking styles which correspond to the forms of government: monarchic, hierarchic, oligarchic and anarchic. *Monarchic* people typically are determined by a specific goal and are single-minded in reaching that goal. They often are led by a particular, singular interest in their life and follow a chosen method of solving the problem (Sternberg, 1997, p. 22). *Hierarchic* people have a hierarchy of goals and they are more open to accepting complexity of the world. They recognize the need to see the problems from different angles and tend to set their own priorities among the goals. *Oligarchic* people have several competing goals and find it difficult to set the priorities among them, they wish to attend to all of them at the same time. They tend to be influenced by the priorities set by other people in their environment (Sternberg, 1997, p. 23). *Anarchic* people have a number of goals which are difficult for them to sort out and prioritize. They attend to these goals and needs in a rather random way, and they are prone to reject systems and rules as confining and restricting them (Ibid).

Thinking styles are further characterized by levels, scope and leanings of mental self-government. By the level people are characterized as global and local. *Global* people when dealing with problems prefer to have the big picture, to see the forest rather than the trees and tend to be generalists. *Local* people concentrate on the details of the problem, they are down-to-earth and tend to see the trees

rather than the forest. *Internal* individuals tend to concentrate on their own ideas, to rely on themselves when solving problems and tend to be less socially aware. *External* individuals are outgoing and people-oriented, they prefer to solve problems together with others, working or learning in groups. Individuals with *liberal* thinking style like to go beyond the existing rules, they are anxious to try new things and experimentation and feel comfortable in ambiguous settings. *Conservative* individuals like to adhere to the existing rules and structures, they stick to familiar situations and prefer environment where ambiguity is minimized (Sternberg, 1997, p. 26).

In subsequent research thinking styles were grouped into clusters of styles designated as Type I and Type II. Type I included legislative, judicial, hierarchic, global and liberal and was associated with greater cognitive complexity, creativity and critical thinking. Type II included executive, local, monarchic and conservative and was associated with lower cognitive complexity, norm-following and dualistic thinking (Zhang, 2002, p. 183). Anarchic, oligarchic, internal and external styles were not included in either Type I or Type II. They are considered as more dependent on the context, can be included in both types but also were referred to as Type III (Zhang & Sternberg, 2005, p. 36).

Sternberg and Zhang have argued that the styles are rather states than traits and, as they research has shown, can be at least partly socialized and modified (Zhang & Sternberg, 2005, p. 37). It depends, for example, on experience and education. In their study on the development of intellectual styles Zhang and Sternberg found associations between types of culture and thinking styles and concluded that “culture is an important factor in the formation of styles” (Zhang & Sternberg, 2011, p. 148).

### **The effects of the internet on cognitive styles formation**

As has been pointed out, digitization and internet technologies have had transformational effect on society. They have changed the conditions of creation and consumption of cultural objects. This gives ground to argue about the rise of digital culture (Manovich, 2001; Miller, 2020). It can be hypothesized, therefore, that digital and internet culture have the effects on the development and formation of cognitive styles. In order to test this hypothesis several research activities have been planned in the project “The impact of internet usage patterns on the development of youth’s cognitive styles”. At the beginning of the project focus group discussions were organized with school and university teachers. There were five focus groups overall: three focus groups with school teachers and two with university teachers. Two of the focus groups with school teachers took place in Riga, one in Liepaja. Both focus group discussion with university teachers took place in Riga, but in one of them there were participants from regional universities. In one focus group there were university teachers of humanities and

social science subjects, in another teachers of technical disciplines and natural sciences. All five groups were organized in May and June 2022. The total number of participants was 39.

In course of the discussions the moderator asked the participants questions about possible influence of the use of the internet on various aspects of learning, including the way the students learn while they work in the classrooms and when working independently. This section will not present a detailed analysis of these discussions but rather will make an overview of the tendencies in the expressed opinions of the participants in terms of Sternberg's theory of thinking styles. In general, participants in all groups confirmed that the internet has affected the way pupils and students learn, receive and assimilate information and knowledge.

**Local.** There were named a number of characteristics of students' learning habits and practices which can be categorized as local style. One of the expressions of that is what can be called fragmentation of knowledge. The teachers commented that students are losing the broader view on things, for example, historical processes. They *"don't see the interconnections because they process fragments of information, which do not make up a whole picture"* (university teacher, communication theory). This may be connected with variety and great volume of available sources of information. Another reason is decline of the ability to read deeply, which was observed by school and university teachers. Pupils prefer to read short texts, for example summaries of longer texts on the internet. They rather skim the texts and often read superficially. Other characteristics related to local style are empirical orientation and lack of abstract thinking. Pupils tend to have "very concrete thinking" (secondary school teacher, special pedagogue), and they lack theoretical skills: "very detailed analysis, but without generalization" (university teacher, sociology). "Abstract thinking is weak" and students often dislike theoretical classes and prefer practical lessons or watching videos on the subject (university teachers, medicine, physics).

**Executive.** Participants mentioned characteristics of students' learning which corresponded to executive style. Teachers expressed opinions that students lack creativity and imagination and are apt to perform tasks which are well structured and precise. *"It is difficult for them to figure out something. It is easier to find out on the internet and copy it"*, said a history teacher from the secondary school in Liepaja. Some said that it is difficult for the pupils to improvise, they want to do precisely as given in the task (secondary school, literature teacher). Social science and natural science university teachers mentioned that it is difficult for the students to formulate their own substantial questions and they lack critical thinking. Many students seem to be satisfied with the executive attitude. *"They do what they are asked to do"* (secondary school teacher, Latvian language and literature), they are prone to follow instructions and *"they need to be told, or written down, and the work has to be clear and concrete"* (school teacher, history and social sciences). Availability of the internet often was seen as a factor

diminishing the independent effort of the pupils, because many answers are available on the internet. As the consequence pupils expect precise formulations of study tasks: *“They are not interested in the essence... They are interested in maximally fast, superficial execution of work”* (school teacher and director, informatics).

**Conservative.** Focus groups participants mentioned traits which can be interpreted as conservative style. Some teachers pointed out that students are unwilling to be genuinely creative and in their projects they often use the materials available on the internet. In connection with this the problem of plagiarism was discussed in several focus groups. Students seek “the easiest way”, that is, what they try is to find readily available solutions. The availability of the perceived solutions on the internet negatively affects creativity of the students (university teacher, computer science). It reduces motivation and effort to be creative. Some participants pointed out to the lack of critical attitude and thinking with respect to the materials the students find on the internet (university teacher, Asian studies). According to some participants, pupils figure out solutions along with “algorithmic thinking or according to a template” (school teacher, special pedagogue). Dualistic and rigid thinking was mentioned as a characteristic of toddlers. ‘Traditional’ way of doing things characteristic of conservatives in the context of digital culture rather means greater reliance on the content students can find on the internet.

**Anarchic.** In the discussions participants pointed to anarchic traits of pupils and students. One of the expressions of that is lack of recognition of the authority of the teachers at schools. Pupils were said to have little respect for the teachers, and may ignore teachers’ instructions and requests. Pupils were said to have other authorities in the world of the media, the authority of the school and the teacher as a source of knowledge was said to be undermined by the perceived availability of knowledge on the internet. *“Pedagogues are not an authority, authorities are on the internet”* (secondary school teacher and director, Russian language and literature). Pupils were said to be learning what is interesting for them: *“I learn what I want, what is appealing to me. (...) And when you say that you should know this, they do not learn it. And then you move on, but they have not got it”* (secondary school teacher, Latvian language and literature). Another expression of anarchic style is the practiced multitasking of pupils and students. They try to do many things simultaneously but in a rather disorganized way. Digital devices also distract their attention. Pupils and students are striving to follow many streams of rapidly changing information and as a result they lose the capacity to focus their attention. School and university teachers also pointed to the phenomenon of “quasi-presence” on the lectures due to divided attention. Yet another expression of ‘anarchism’ is an informal style of communication adopted by many pupils and students in dealings with the teachers.

Traits of **judicial** style were expressed in a more indirect way. Pupils may become interested in a particular topic and learn about that from the internet materials, for example, on YouTube channel. Then they critically evaluate what the teachers or their fellow pupils say on this topic. Egocentricity and “heightened subjectivism”, pointed to by the participants, as an expression of the tendency of individualization reinforced by digitalization and the internet, in some contexts, especially in combination with dualism and rigidity of thinking, can be interpreted as a feature of a **monarchic** style. **Hierarchic** style was discernable from such characteristics as purposefulness of the pupils who are motivated to continue their studies and succeed in a selected career and a more purposeful and skillful use of the internet for study purposes. **Oligarchic** style could be inferred from the descriptions of popularity of messengers among pupils and students who use them for social and study purposes. With regard to the scope dimension of thinking styles the evidence from the focus groups varied. Some participants said that students and pupils readily communicate with each other, especially using messengers, when working on tasks and problems and like to work in groups. Other teachers pointed to out that students shy from direct interaction and communication with the teachers and that it is difficult to engage students in proper, substantial discussions during the classes. This evidence points to a mixture of **internal** and **external** styles. Some cognitive tendencies, such as preference of the use of visual, video and audio formats of study materials to reading the texts cannot be categorized in terms of Sternberg’s theory.

The bulk of the traits mentioned by the participants in connection with the use of the internet in the learning process correspond to Type II of thinking styles which is associated with superficial learning (Zhang & Sternberg, 2005, p. 16). It should be noted, however, that focus group discussions as a research method has its limitations. It encourages the expression of opinions by the participants but also may create bias by reinforcing particular points of view. This data may be taken as indicative of the existing trends and are in accord with the position of some informed critics of the internet and its effects on cognition (Carr, 2020). But rather than arguing for a complete characterization of the thinking styles of contemporary youth, this overview of focus group discussions materials demonstrates an application of the theoretical perspective outlined in the paper. In course of the research project, other research methods will be employed, including a representative survey and psychological testing.

## Conclusion

This paper has provided theoretical explanation of the posited influence of digital technologies and the internet on learning and cognition from the perspective of cultural-historical psychology. This explanation involves the concepts of intermediation and psychological tool. According to cultural-

historical psychology, the development of higher psychic functions involves the cultural means of intermediation. In cultural-historical psychology such cultural means primarily are signs, speech and language. This paper extends the meaning of psychological tools to intellectual technologies, such as writing, printing, and information and communication technologies, including the internet. Social and psychological effects of these forms of intermediation have been observed in different historical periods by researchers in such disciplines as sociology, anthropology, media studies and linguistics.

Digital media and the internet have specific features and their great possibilities and wide application have had transformational effects on society. Over the last two decades digital culture emerged. Digital electronic devices are networked and multifunctional. They are used by the young people for many purposes, including learning. The internet is used by them as a source of information for studies and as the means for communication and cooperation. It is an important ‘prop’, or ‘scaffolding’, for their learning and cognition. Continuous presence of digital technologies in their lives has influence on the habits and practice of their learning, their beliefs about studies, information and knowledge. As a consequence, these practices have influenced formation of their learning or cognitive styles.

Participants of focus group discussions attested such influence of digital technologies and the internet on pupils’ and students’ learning and cognitive styles. Sternberg’s theory of thinking styles was applied to the analysis of focus group discussions materials. The content analysis identified local, executive, conservative and anarchic styles in these discussions as more prominent in connection with the use of the internet in the learning process. Local style was related to students’ inability ‘to see the forest behind the trees’, to form substantial generalizations and linked to fragmentation of knowledge. Executive style was found in students’ inclination to look for ready solutions available on the internet. Conservative style was observed in the tendency to follow a patterned, algorithmic thinking. Anarchic style was registered in students’ denial of authorities in formal education system and disorganized character of their learning under the influence of distraction and multitasking. Other styles associated with more complex thinking (Type I) and more purposeful and creative use of the internet also could be indentified but they were mentioned less frequently and applied by the participants to a smaller share of students.

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