Psychological aspects of literacy

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Abstract

Literacy is a complex cultural and social phenomenon with multiple effects on both, the individual and social levels. This article presents multidimensional model of literacy with linguistic, cognitive, socio-cultural, developmental and educational dimensions. A use of literacy is a literacy event and it means the use and/or presence of all dimensions of literacy. The use of new technologies and the emergence of digital literacy brought about a new meaning of literacy. There are two main processes to stress: (a) the writing (text) is more and more dominated by images and (b) the book is going to be replaced by the screen. These facts raise at least two questions: what is the future of literacy and what are psychological, social and cultural effects of these changes? The aim of this article is to present a psychological view of literacy skills with a very modest aspiration to offer a better understanding of library users and non users.

KEYWORDS: literacy, reading, writing, digital literacy.

Introduction

The interest in literacy and its nature increased during the last twenty years. It was instigated by the awareness of importance of literacy (and education) in everyday life and its influence on all fields of personal and social life (i.e. schooling, workplace, family life, health, free time). Recent research[1] conducted over several generations confirms the significant role of literacy in human development at both, the individual and social levels. It is possible to partially explain the increasing importance of literacy with the expansion of information and communication technology (ICT) in all of the fields of human activity: education, workplace, housing, traffic, health institution etc. The use of IC technology implies the application of literacy skills.

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[1] There are different researches on literacy competence usually realized periodically every 3-5 year as: Progress in International Reading Literacy Study– PIRLS for pupils after four years of schooling, Programme for International Student Assessment (PISA) for 15 years old students, International Adults Literacy Survey (IALS later named ALL/PIAAC) for adults from 16-65 years, etc.

New ways of using literacy are reflected in the change of literacy definitions. In the past, literacy was described as the ability to read and write using alphabetical and numerical systems relevant to a language, culture and society. Nowadays, the adequate literacy also requires understanding and thinking critically about the written material, as well as creatively and correctly communicating in written form. Technological development enables communication in different forms and with different tools. At the beginning of the 21st century literacy encompassed a complex set of abilities needed to understand and use the dominant symbol system of a culture, and this was a basis for the personal and community development. In technologically developed societies the concept of literacy is expanding to also include media literacy, information literacy, digital literacy, etc.

Literacy is a multidimensional phenomenon and it is an object of investigation in social sciences, humanities and natural sciences. Different disciplines emphasize different aspects of literacy; linguistics – the importance of language, cognitive psychology – the mental processes used in the generating of meaning etc. Educational sciences are focused on literacy as well; they collect various theoretical views and research results in creating their methods for literacy education.

This article deals mostly with the psychological aspects of literacy.

Dimensions of literacy

An attempt to relate different aspects of literacy is made by author S. Kucer (2009). Kucer describes literacy as complex multidimensional phenomenon with linguistic, cognitive, sociocultural, developmental and educational dimensions. A use of literacy skills (reading or writing) is a literacy event. Every literacy event includes all dimensions: linguistic, cognitive, sociocultural, developmental and educational dimension. Proportion of a particular dimension can vary, but all dimensions are present. To become literate means to learn how to effectively use all of the dimensions of literacy.

Linguistic dimension of literacy

The language is the fundamental instrument for the construction of meaning in an oral or written message. Literacy is based on the language system and they are inseparable.

The history of writing begins with non linguistic elements such as drawings and pictures. The inventors and first users of writing were merchants. They needed a way or a tool to record their trade. The increasing use of drawings and pictures to record the business data led to a simplification of symbols to expedite the recording. The first users of writing also realized that written communication

(i.e. writing) has to be efficient and precise. For example, to register quantities it was necessary to draw the number of symbols equal to the quantity of goods. It became clear, that it was easier to have a solution such as figures for numbers. The invention to note one sign for one sound in the word was highly abstract and very economic. Using 25-30 signs (letters) for writing is acceptable for the capacity of human brain (memorizing ability). The character of writing became increasingly similar to language and more connected with language rules. Speakers of particular languages became aware of language forms and of ways how to express themselves and to be understood by others. The development of written communication refreshed the language and stimulated the development of language structures.

Complex language structures allow for fairly precise and comprehensible communication. There are different fields of language systems: phonetic, semantic, syntactic and pragmatic. Phonetic characteristics of language (sounds used in a language) and especially the transformation from oral to written form may cause difficulties in the process of learning to read and write. The better the correspondence between oral sound and written symbol (letter), the easier it is to learn to read and write.[2] Semantic aspect of language refers to the meaning of words and word interrelations. Extensive vocabulary and familiarity with the meaning of the words enables individuals to understand what is being communicated and to express themselves. Syntax defines rules for the construction of sentences and grammar defines rules necessary to achieve the meaning. Both are very important for effective communication. Orthography as the standardized system of writing in a language contributes to the more precise meaning and has to be learned. Literacy depends on language competence. (It is comparable to literacy skills in second language; the prerequisite to achieving literacy skills in second language is fairly good language proficiency.)

There are some differences between oral and written communication. Oral communication is happening here and now (it may be face to face), and is usually accompanied by some sort of nonverbal communication (gesticulation, face, voice). The nonverbal communication supplements the meaning of the words. The speaker has immediate feedback on the content, can change communication, clarify, if necessary, wait for the answer and then continue. Oral communication is usually not registered and it is often "lost in time". In written communication there is always a delay; a time passes from the moment written information is created until the time the information is read. There is not only delay in time but distance in space between the author and the reader. With feedback a speaker can adapt the communication immediately. The author of written communication has to imagine the potential reader(s) and can not make any changes: the message is registered "for ever".

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2   In contrast to English language the Croatian language has a high level of consistency between oral and written language, it is used approximately one sign (letter) for one sound.

Literacy is not the transformation from oral to written language, because there are some differences between oral and written language and communication. The distance between the two forms of communication depends on concrete language and individual style of expression. In oral communication we usually use short and simple sentences, more repetitions, less adjectives and professional terms. The content is conceptually thin and, in a way, dependent on the feedback. In written communication the text is conceptually compact, we use various terms, professional and precise terminology while sentences are longer and grammatically complex. Oral communication is an auditive stimulus, written communication is a visual stimulus. These facts affect perception, learning styles etc. These differences partially explain why some individuals benefit more from oral (auditive) while others do from written (visual) communication and also, why some are better speakers while others are better writers.

Language competence is important for learning of reading and writing. Insufficient knowledge of language impedes the learning and the use of literacy skills.

Cognitive dimension of literacy

Cognitive activity in literacy is related to mental processes and strategies activated during the reading and writing activity, i.e. discovering and creating the meaning. The process of reading starts with perception of written material, letters etc. The decoding process of written text is not a perceptual "one way process". It is a constant interaction between visual and non-visual area of information, an interaction among perceived visual stimulus of written text, linguistic knowledge of meaning of particular words, forms used, literacy skills etc. The knowledge of literacy consists of understanding how the spoken language is transformed into written form. Alphabetical writing uses a symbol (i.e. letter) for every sound of spoken language. The transcription from sounds to letters is not consistent in every language. For correct use of literacy as a tool it is also necessary to consider the rules of using different forms of letters (uppercase and lowercase), the direction of writing which in most languages is from left to the right and from top to bottom, using titles and subtitles, paragraphs, etc. Cognitive activities related to discovering the writing system dominate at the beginning of learning to read and write. Later, when literacy skills are automated, the main attention is dedicated to the content of what is read or written.

The results of reading are different for different readers. They depend on the ability to relate the message in the text (content) with proper knowledge. The knowledge is an unstable and changeable category. The text might include some completely new knowledge for the reader or knowledge that builds on to the existing one. Both cause the change of the existing knowledge structure of an individual. Changes of the knowledge structure at the individual level depend on the ability of reflection and critical thinking of the content. The process of

constructing knowledge is complex, depends on the understanding of proper knowledge (metacognition) and the learning processes. To summarize, the result of reading is a product of basic message of the reading material and the personal response.

Literacy activities of reading and writing activate cognitive processes of different intensity. Reading is considered to be more passive than writing; the reader uses less cognitive ability than the writer. The reader "only" has to decode written material and discover its meaning. The writer has to create the meaning and to code proper thoughts into words and sentences which is a more demanding cognitive activity. When the writers do not know the readers of their text, they have to identify themselves with readers and it may be challenging to make texts understandable for others.

There are also some similarities in processes of reading and writing regarding cognitive dimension of literacy. Both activities are inspired by looking for meaning and are not possible without active use of linguistic and cognitive abilities. We are not able to read or write without a proper linguistic and cognitive competence. An example is reading and writing in a second language. It requires a certain level of linguistic competence (language proficiency) to be able to read with comprehension and write effectively in a second language. Both processes include interaction with our existing knowledge. We want "to give or to take" some information.

There is another similarity between reading and writing. An intention (motivation) is always present behind both activities and it is a reason why somebody reads or writes. Let us ask why people read newspapers, books, weather forecasts and why they write e-mail, messages (such as text messages), annual reports, notes, etc.? There must be a need which motivates people to read or write. The factor of motivation is very important in the field of literacy. Motivation is the incentive for different literacy practices and it is sometimes underestimated. The explanation of reading habits and reading culture is not complete without understanding the motivation for observed reading behaviour.

A very intensive cognitive activity is happening during the process of learning to read and write. Reading and writing are cognitively high demanding activities because of the complex interaction of different brain areas: visual, auditory, speech, etc. There is a long neurological way from seeing a word to pronounciating it, hearing a word and writing it on paper, recognizing words and discovering their meaning, etc. It takes time for the multitude of neurological connections to become solid and for the activity to run automatically, as a skill.

Last but not least, reading per se stimulates thinking. Reading is an activity which expands knowledge connecting the old with the new information. To read means to process new contents, understand concepts and relations, follow a different way of thinking, memorize and use new knowledge.

Social and cultural dimension of literacy

Literacy is a way of communicating. For Barton (2009) literacy is installed in a social context and it always represents an interaction among individuals. The action is connected with literacy, derives from individual and is destined to the social environment.

As an activity connected with printed material with the purpose of communication, literacy is a social act. Acts repeated at the individual or group levels are named literacy praxis (i.e. use of library is a literacy practice). Sociocultural dimension of literacy is intended to be the product of an individual's acts or practices connected with literacy and of belonging to various groups. Literacy level of an individual is the result of linguistic and cognitive abilities, and of social and cultural context that individual belongs to. For example, *street children* in big cities around the world usually are not able to practice literacy. They do not have the stimulation in their environment for the development of their abilities, they have no school or a teacher. Their illiteracy is the result of their social and cultural conditions.

Sometimes a literacy act is a self oriented activity i.e. the purpose of reading books or writing a diary (or memoires) is to satisfy personal needs. Most of the time literacy is a communication at the social level. Social character of literacy is reflected in literacy praxis of a social group. Social groups are determined by their culture, social status, education, age, attitudes, values etc. Cultural habits, beliefs and values are related to literacy practice and have strongly influenced it. For example, fisherman is informed about weather forecast, farmer will learn about pharmacological protection of crops, the lawyer follows the legislation, the stylist will follow the fashion, etc. The way information sources based on literacy are used may be deeply rooted habits. (Librarians know how hard it is to transform someone from a non-reader to enthusiastic reader or to increase the membership of the library.)

An individual is a member of different social groups: family, school or workplace group, friends, organizations (sport, social, professional, religion etc.), cultural and ethnic groups, groups based on age. The functioning of various groups consist of literacy acts as a part of the interaction with the environment and of maintaining the collective knowledge. Individual literacy practices are stimulated by belonging to the social groups. Social groups are not a firm and static structure, they change and adapt themselves to the changing world. Literacy is one of the tools in their operation. An individual is a member of different groups and he/she uses literacy in different ways.

For example, a woman employed in a laboratory has to practice her literacy skills at the work place. As a parent she uses her literacy skills in helping with homework and education of her children. As a housewife she will practice literacy skills in housework: calculating expenses, making shopping lists, reading and

writing recipes, planning holidays etc. As a member of a voluntary mountain rescue team she will practice literacy related to climbing, first aid, etc.

The influence of social and cultural environment is evident in the field of family literacy. Family literacy is an umbrella term for all activities within the family that are related to literacy. The term refers to a complex concept associated with the relationship between the family and the development of literacy. Literacy levels and reading culture of children are related to literacy levels and habits of their parents. It seems that there is an intergenerational transfer of literacy levels within a family. Children usually reach the level of literacy similar to the literacy level of their parents. There is a progress in literacy levels from generation to generation, more and more people are literate, and the literacy is wider spread with newer generations. Changes in the way of life increase demand for literacy skills. The parents wish for their children to have a higher level of education then their own. In better education they see possibilities for better life for their children. During the schooling parents help and motivate their children and some children succeed to significantly surpass their parents in the area of literacy and education.

Children's literacy also depends on importance and value the family attributes to reading, learning and knowledge in general. Literacy level influences the functioning of the family in everyday life: education of children, health care, employment possibilities, free time activities, use of ICT based machines at home and out of home (personal computers, TV, cash machines, phones, parking ticket machines etc.). Frequent use of literacy for the achievement of family goals will reciprocally improve the literacy of all family members.

Developmental dimension of literacy

The developmental dimension of literacy can be observed at the social and individual levels. The invention of writing appeared at various places in the world associated with economical and cultural growth of society. The developments of writing systems and literacy have a long history. The writing system used in Europe (i.e. alphabetical writing) transformed in several ways: from pictographic to alphabetical writing, from block letters to written letters, from handwriting to typing. Nowadays with the expansion of ICT this development continues.

There is a long process of the development of literacy skills at the individual level as well. Learning to read and write (the development of literacy) is much more than recognition of letters; it is the acquisition of knowledge how is the spoken language transformed to written form - understanding of the writing system. It means the development of abilities needed for effective connection of linguistic, cognitive, social and cultural dimensions in a broader context. Development of literacy skills happens for the duration of the entire life. Literacy has to be improved and used in everyday life. As with other skills (in sports,

playing musical instruments etc.) it is important to maintain the acquired skill – "use it or loose it".

Literacy development starts very early, even before formal schooling. The literacy development of children depends on biological factors and maturity as well as on the family environment. It starts with speech development. The early stage literacy is the development of various abilities necessary for the acquisition of literacy skills and it begins with the first communication and language development. This development refers to vocabulary, narrative skills, phonological awareness, interest for printed material, motivation to learn letters, etc. The child very early recognizes the importance of speech and language for communication with others. Stimulative environment fosters a child's desire to communicate and it encourages all aspects of language development: pronunciation, vocabulary, language rules. Adequate language development is a prerequisite for literacy development. Children with rich vocabulary know the meaning of words, they are better in understanding of content and they are faster to acquire the reading skills. Learning vocabulary is easier with listening of reading and storytelling. Stimulating children to participate in storytelling enables the child to develop proper narrative skills. More experiences with verbal communication will facilitate the process of phonological awareness. Phonological awareness is the ability to recognize the phonologic structure of language, to realize that a word is composed of sounds. The awareness on the phonological structure of spoken language is the result of teaching. Without the explanation and understanding that the words are composed of sounds and each sound has a graphical sign – a letter, children would not be able to learn to read and write alphabetical writing. Early stage literacy also includes children's knowledge about reading and writing. A child is active and curious by nature. When surrounded by printed material the child will note that words are written in rows, and that the direction of reading is from left to right and from top to bottom. Print uses different shapes of letters, print material have different forms (books, news paper, calendars, etc.). The possibility to manipulate with print material will motivate children to ask about the content of the text, the way of writing and reading, the names of the letters. When children have this sort of environment and stimulation during their growth, the result will be the accumulation of valuable knowledge important for learning to read and write. The support of early stage literacy at home is an important stimulation for literacy development.

Not all the children have adequate conditions for literacy development and there are millions of children in the world who start the school unprepared. They depend on school organization and local community to acquire the literacy skills. This is a field where libraries are very active all around the world; they are initiators of activities to facilitate literacy development of all children.

Learning literacy skills depends on children's environment and biological characteristic of a particular child. The learning of reading and writing has an

individual course. Some children are fast, some children slow, some children have severe difficulties in learning to read and write and some of them never learn to read and write properly. This kind of learning disability is named dyslexia. It has very individual appearance and is connected with brain organization and functioning. There is a wide network of researchers studying dyslexia, ranging from the psychologists to neurologists. Their results are used by professional and other kinds of aids who are working with children and adults with dyslexia. Work with dyslectic children takes a long time and the progress comes slowly. In the last two decades there is a lot more information on dyslexia, better understanding and more tolerance for children with dyslexia. This is important because "some organization (of the brain) may not work well for reading, yet are critical for the creation of buildings and art and the recognition of patterns – whether on ancient battlefields or in biopsy slides" (Wolf 2010, 215).

Educational dimension of literacy

Literacy is connected with education in many ways. Literacy is an important tool for the majority of educational programs. Without literacy it is hard or even impossible to reach the educational goals.

Literacy is a skill, so teaching is necessary. Understanding the dimensions of literacy (linguistic, cognitive, social and cultural) is important for successful teaching. The results of research on different fields of science should be implemented in educational program to improve the literacy instruction at all levels and for all generations. The literacy instruction is one of the most important tasks of the elementary school. Observing historically, with new methods and tools getting introduced into literacy instruction, increasing number of people achieve the basic literacy level. Contemporary life requires more skills and the basic education is longer and more demanding.

Literacy levels correlate with educational levels. The literacy levels in adults indicate that literacy level corresponds to years of schooling (OECD 2000). More years of schooling – the higher the literacy level. It seems that twelve years of schooling are necessary to achieve the literacy level which is resistant to forgetting. This is the skill level that allows for the improvement of the existing basic skill set with the additional skills that emerged with the development of ICT.

Literacy in digital environment

The use of new technologies and emergence of digital literacy brought a new concept of literacy, for example handling the information. Digital literacy is the ability to locate, organize, understand, evaluate, and analyze information using digital tools and sources. It involves a working knowledge of current technology and understanding of its use. On the topic of traditional and new literacies

there are two main processes to mention: first, the writing (text) is more and more dominated by images, and second, the book is going to be replaced by the screen.

What are potentials of image as a resource to make meaning? Can image do what writing does? "The world told is a different world to a world shown" (Kress 2006, 1). How are these changes reflected on the functioning of an individual? These are the questions to be answered in new research on the emerging forms of literacy. Some of the answers can be found in the work of Kress and van Leeven (2006) which is presented in the following text.

Words vs. images

The communication with images is different from communication with words. A short comparison of words and images as tools for communication will be presented here. *Words* in a text have a static and unchangeable condition. They have a linear dimension corresponding to the time of reading. As we read we discover the meaning. The order of information is directed by the author and we have to read from the beginning to the end to receive all the data. Intake of the information is sequential. The communication through *images* (possible with the use of new technologies) offers written text, images and sound. At the same time it allows for the interaction with hypertext and a very individual way of receiving and processing of information. It is possible to skip familiar information and to examine some the less familiar one. It is possible to create an individual construct of knowledge. A written text has a limited quantity of knowledge determined by the author's knowledge or his/her selection of knowledge of the text. The ICT offers new possibilities, provides an immense quantity of information, and a lot of interactivity. It even makes it possible to the contact the author of the text. These differences in flow of information between *words* (textual information) and *images* (combined text, picture etc.) have direct impact on understanding and constructing of new knowledge and its memorization.

Images provide information through the logic of space and the importance is determined by the position - central or peripheral. In writing the only tools are words. Images use different tools: words, picture, sounds etc. The use of written language assumes the application of literacy rules – literacy grammar, while the images assume the "freedom" of language, as well as the use of new forms of words and expressions. New technology makes it possible to communicate in a non-linguistic multimodal way with pictures, symbols etc. The use of ICT in everyday communication simplifies the use of different linguistic and non-linguistic tools: written language, abbreviations, symbols and signs (Crystal 2006). This is diffused in short communication units (i.e. short messaging services – sms, e-mail) where the use of abbreviations, punctuation etc. is common practice.

Understanding and using images requires some rules as well. Usually, the purpose of communication is to achieve the unambiguous meaning and understanding and this is why some rules are necessary. Kress and van Leeuwen (2006) use the term "grammar of visual design" which is similar to grammar of language. Grammar of visual design is "the way in which depicted people, places and things combine in visual statements". (Kress and van Leeven 2006, 1)

The future of literacy

In the past, changes in literacy had been the incentive for human development.

The invention and use of writing systems stimulated the development of language: vocabulary, grammar, orthography etc. The contemporary way of using written language is the product of many centuries long writing practice. There was an enormous number of trials while searching for the best forms to express ideas, obtain desired meaning, achieve appropriate communication etc. All these trials resulted in the richness of the existing language system.

For a long time transfer of knowledge was based on the oral communication, which was not economic and reliable. Writing made the preservation of accumulated knowledge and its dissemination possible. With writing begins the recording of history, description of events, capturing the way of life and cultural heritage becomes preserved. Writing was useful for the individuals in everyday life; recording of what is happening in different places made it possible understand and be aware of the social development.

There are several inventions, which have had positive influence on human development. An example on how literacy tools were stimulation for human brain and its development are geographical maps (Carr 2010). The development of cartography made the presentation of three dimensional spaces possible in two dimensions. Representation of the outside world as two dimensional phenomena requires an abstract way of thinking and is a challenge for the brain. There is no need to talk about the advantage of geographical maps for the mankind.

Some inventions "attacked" writing directly. In a way they treated the development of literacy. Gutenberg's printing machine was seen as "danger" to writing. It seemed that with printing it will be possible to expand knowledge among ordinary people and to endanger dominant social class. Television was accepted as a direct rival to newspapers. The same goes for ICT, e-books etc. These inventions created fear the earlier achievements would go extinct. Looking back in the history what happened to these inventions it becomes evident that people are adaptable, they use and choose what is better for them. For example in Europe the television and the newspapers have been coexisting for more than fifty years.

The future of literacy depends on the way people will use the digital literacy and the ICT tools to serve human needs and functioning. ICT has been around for about fifteen years in the form of consumer goods. Some research results indicate that there are some changes in the way people read using ICT: their attention is shorter and they are distracted. The reading process is composed from short reading phases, it looks like the reader is not able to follow longer text or to be deeply engaged in reading. The reading is sporadic and poor memorization of contents is one of the consequences. Because of the many interruptions, the lack of clear view over the whole content with its essential and peripheral elements, the understanding could be insufficient and the knowledge inadequate. These are mere observations, the new research will give more answers soon.

A lot of questions arise at a higher level: What is the task of elementary school in the new media age? Are existing instructional methods good enough for the digital literacy age? How to organize literacy education at all levels to develop students' competences for life in a digital environment? What is changing in library use? Do we have new roles of libraries? What are the expectations from library staff?

Conclusion

The development is happening. New inventions and new technologies are expression of human will and human needs. In the field of literacy there is space for new kinds of literacy. The plasticity of brain will make new adaptations possible in individuals and the society.

By understanding the historical development of writing, the way of learning to read and write and the importance of literacy in everyday life, one cannot but wonder and appreciate the complexity of phenomenon of literacy as a human invention.

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Sažetak

Psihološki aspekti pismenosti

Pismenost je složeni kulturni i društveni fenomen s višestrukim utjecajima na individualnoj i društvenoj razini. Ovaj rad predstavlja višedimenzionalni model pismenosti koji se odnosi na jezičnu, kognitivnu, društveno-kulturnu, razvojnu i obrazovnu dimenziju. Korištenje pismenosti je događaj koji podrazumijeva korištenje i/ili prisutnost svih dimenzija pismenosti. Korištenje novih tehnologija i pojava digitalne pismenosti dalo je pojmu pismenosti nova značenja. Treba naglasiti dva glavna procesa: (a) u pisanom tekstu sve više dominiraju slike i (b) knjiga će biti zamijenjena ekranom. Te činjenice otvaraju barem dva pitanja: što je budućnost pismenosti i koji su psihološki, društveni i kulturni učinci tih promjena? Cilj je ovoga rada predstaviti psihološki pogled na vještine pismenosti sa skromnom težnjom da se ponudi bolje razumijevanje knjižničnih korisnika i ne-korisnika.

KLJUČNE RIJEČI: pismenost, čitanje, pisanje, digitalna pismenost.

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