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VISUAL LITERACY IN THE CONTEXT OF DIGITAL EDUCATION TRANSFORMATION

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ABSTRACT

The evolution of digital technologies and the use of visual media in our everyday life highlights the necessity to educate visually literate individuals. The Organisation for Economic Co-operation and Development (OECD, 2018) has launched the Future of Education and Skills 2030 that emphasizes that due to the digitalization into all areas of life, digital and data literacy are considered to be core foundations and being literate in this context requires the ability to comprehend, interpret, use and create textual and visual information in various formats, contexts and for diverse purposes (making meaning based on encoding and decoding signs/sign systems). The concept of visual literacy has been studied for several decades, however, it is a relatively new study area within a digital environment in Latvian media and education context. By bringing attention to the practice and reporting students comprehension and competency within the domain of digital visual literacy, the author reports the findings of a study that examined the competence of the sub-domain of visual literacy, applying Inquiry Graphic (IG) as a framework for the analysis. The purpose of this paper is to contribute quantitative and qualitative data to the domain of visual literacy amongst the Riga Art and Media school final year students and conceptualize visual literacy in the process of digital education transformation, proposing further research on academic practice and pedagogical tools to improve a person's visual literacy and visual media competence in a digital environment.

Keywords: *visual literacy, digital visual literacy, media literacy, vocational education, visual semiotics.*

Introduction

In the era of digital transformation, the importance of images and visual media in contemporary culture is changing the perception of what it is to be literate in the 21st century. Distance learning has made a significant step in the digitalization of the learning process and materials. If students are taking an active part in all dimensions of life, they will need to navigate through uncertainty, across a wide variety of contexts: in time (past, present, future), in social space (family, community, region, nation, and world) and digital

space (Organisation for Economic Co-operation and Development, [OECD], 2018). Exposed daily to visual media does not necessarily mean that individuals can critically view, use, and produce visual content (Avgerinou, 2009, Brumberger, 2011, Messaris 2012, Matusiak, 2020). Comparing the importance of visual literacy among other literacy types, it is highlighted as one of the most essential for 21st-century learners considering the digital contexts and the use of digital visual media tools (Matusiak, 2020; Messaris, 2012; Avgerinou, Pettersen, 2011, Kedra, Zakeviciute, 2019). Digital Education Action Plan (2021–2027) issued by European Commission includes guidelines to adjust education and training for a digital environment. Understanding the risks and opportunities of digital technology, educators are responsible to introduce and guide students through safe and meaningful uses of digital technology by educating individuals to develop the ability to critically approach, filter, assess information, and be more resilient against manipulation. The Republic of Latvia has developed Youth Policy Guidelines (2021–2027) identifying key policy initiatives to improve digital competence, including media literacy, of young people promoting meaningful participation in the digital environment.

Latvian National Reform of School Education foresees that the European Social Fund project Competence Approach to Curriculum (School 2030), implemented by the National Center for Education is to develop, approbate, and subsequently implement general education content and learning approach that provides the knowledge, skills, and attitudes needed for 21st Century. Since year 2020 schools in Latvia gradually started to implement curricula and approaches in accordance with the new standards of primary and general secondary education. Within the project transversal competencies which help to acquire knowledge by different learning techniques are defined. Those transversal competencies include digital literacy and critical thinking, both including sub-competencies of visual literacy and media literacy. There is an interconnection of visual and media literacies – now that the ability to produce and reproduce images has been extended to the masses through technology, visual literacy, and media literacy can connect on an aesthetical level as well as the level of medium (Chauvin, 2003). According to Kedra (2018), visual literacy is used as one of the skills belonging to media literacy, digital literacy, or multimodal literacy, suggesting that in the context of contemporary digitally mediated visual communication visual literacy should get individual recognition.

This paper aims to analyse the comprehension of visual literacy amongst the Riga Art and Media school final year students, developed accordingly to evaluate the competencies within the sub-domain of ‘responding’ to digital visual imagery and conceptualize visual literacy in the context of the digital education transformation.

Theoretical background

The founding definitions of visual literacy were formulated in the pre-digital era. During the sixties the concept of visual literacy gained a comprehension upon a growing impact of television amongst society, especially the younger generation. Debes (1969) has introduced the first definition of visual literacy defining that visual literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences stating that the development of these competencies is fundamental to normal human learning. According to Debes (1969), by developing visual literacy, it allows a person to critically interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment.

Since then visual literacy has been conceptualized and defined in multiple ways across different disciplines and contexts, considering its multidisciplinarity and its conceptual diversities within the specific field. Considering the attempts to create a unified theoretical framework, Kedra (2018) argues that while there is a great emphasis and contribution to the theoretical aspects of visual literacy, it is insufficient for visual education practitioners. As a response, Kedra (2018) proposes to focus on the practical application of visual literacy theory into education by identifying the skills that a visually literate individual should possess and demonstrate, especially in the context of visually mediated communication, digital technologies, and new media. Kedra (2018) states that visual literacy is not a naturally occurring competency, acquired while frequently encountering images of various kinds. Based on Kedra (2018) review of visual literacy definitions published between 1969 and 2013, types of visuals within visual literacy definitions are images, media, messages, symbols, visible actions, objects, and visual literacy concept combines skills in visual reading (interpreting, meaning-making), visual writing skills (using or creating images) as well as visual thinking and learning abilities and other visual literacy skills.

Contemporary definitions of visual literacy are oriented towards visual literacy within a digital environment highlighting the use of digital media, digital imagery, digital symbols, digital messages, and other digital visual communication tools. A conceptual framework of digital competence developed by (Avni, Rotem, 2016) consists of a synergetic complex by eight fields of digital literacies including digital visual literacy which is the ability to critically read, interpret, analyze and to produce meaning from information and messages presented in visual form, by communicating and transmitting visual messages effectively.

According to Avgerinou and Petterson (2011), the main components of visual literacy theory are visual perception, visual language, visual learning,

visual thinking, and visual communication. Considering the digital context, Lackovic (2020) explains how signs make meaning to a human mind and relate it analytically to digital photography. Lackovic (2020) proposed semiotic analysis emphasizes the symbolic interrelatedness between perception, materiality, abstract concepts, thinking, and knowledge, suggesting that academic agents could teach and research complex and interrelated nuances on how signs make meaning to cultivate critical and post-digital semiotic awareness. Moreover within this conceptual framework of digital competence, imagery (including photographs) is defined as visual text. This approach continues to emphasize the visual language, which is structured and can be processed in similar ways as other linguistic forms. This approach roots back to Barthe's (1977) ideas within semiological theory about photography having its linguistic powers. Barthes discusses a relation between a signifier and a signified and the meaning of denotation and the connotation of any system of signs, including visual images. To comprehend the complexity of picture meanings, Barthes has inquired about the distinction between the denotation and connotation of a picture. A denotation is a direct explanation of the displayed object in the picture while connotation is the associated, immediate cultural meanings derived from what is seen. Lackovic (2020) emphasizes that the connotation level is where the interpretative diversity starts to become more distinct. Further socio-cultural meanings of denotative descriptions are assigned to the photograph by interpreters. Aiello (2020) discussed contemporary approaches to visual semiotics focusing on the cultural and social contexts in which images are made and consumed, arguing that traditional semiotic analysis doesn't offer enough analysis for the critical aims of imagery. In the times of digital reproduction, it is above all important to follow where images are published, what is their original source and the context of use. Similarly, Messaris (2012) has reflected on the ways visual media has evolved, focusing on two major technological changes in visual media – the powerful techniques for the digital manipulations of photographs and the invention of the computer-generated photo-realistic imagery – and the cultural transformations following those changes. Throughout his research Messaris (2012) had discussed the psychology of perception and how meaning is constructed through images, highlighting the impact of digital media on visual communication.

Comprehension of visual literacy concept in this work is linked to the ideas developed in the European Network for Visual Literacy (ENViL) research manuscript Towards a Revised Model of the Common European Framework of Reference for Visual Competency, which defines that visual literacy includes two dimensions – the process of creating visual material and responding to visual material. The generic components of visual literacy in the sub-domain of producing visual imagery are the competency

to generate visual ideas; the competency to do visual research; the competency to make visual images; the competency to present one's images; the competency to evaluate one's images and image-making processes. The sub-domain of responding to visual imagery includes the competency to look at images; the competency to research images; the competency to evaluate images; the competency to report about images (Schonau et al., 2020). Avgerinou and Pettersson (2019) define that visual literacy skills are specified from responding perspective as reading/decoding/interpreting visual statements; from creating perspective as writing/encoding/creating visual statements and the third perspective – thinking visually. The competencies of a domain of visual literacy two sub-domains – creating and responding – function along with the more generic personal, methodological, and social competencies. These represent all types of competencies that play a role in any action or (learning) situation and that are relevant for all school subjects (Schonau et al., 2020). Similarly, Avgerinou (2009) suggests that schools should take advantage and seek methodologies for incorporating visual literacy instruction into everyday curriculum.

Visual literacy in educational practice

Considering the digital education transformation, the daily use of visuals within education remains increasingly relevant. As digital technologies are a necessity nowadays for managing an educational process, visuality plays a crucial role in studies as much as in everyday communication and leisure. Lackovic (2020) argues that associating pictures only with mass thinking and media persuasion is a primitive way of thinking. It has contributed to undermining pictures in education. Kedra, Zakeviciute (2019) indicates that visually-based teaching empowers learners by opening new possibilities for sharing. High-quality visual education requires skilled and visually literate teachers. Blummer (2016) introduced some visual literacy initiatives in academic institutions illustrating best practices implemented in the study process of academic institutions. For example, universities for enhancing students' visual literacy focused on the development of workshops and digital tools; the creation of visual literacy tutorials, discussing the ethical aspects of digital photography; creating websites that provide students an introduction to the grammar of visual design, including visual examples and possibilities to practices visual analysis and interpret imagery; providing students with standard visual literacy vocabulary, the creation of visual arguments, utilizing film, television, and photography to promote visual literacy, providing education programs and courses. All of the efforts served to focus attention on the importance of visual literacy competencies in higher education, but as the main conclusion – all the initiatives lack a unified instructional approach.

Riga Art and Media School is a vocational educational institution, where students acquire professional qualifications and the development of professional skills. During the 4-year study process in the Photography design program, students are introduced to the basic processes related to photography, including the technical aspects of photography, digital photo processing, scenography, various graphic and multimedia design programs, latest technologies, and alternative techniques in photography. While there is a great emphasis on the technical side of producing photographic content, many aspects of visual literacy are not included in the study program and it is under the responsibility and initiative of educators to cover all visual literacy competencies in their subjects.

Method

The study adopted a mixed method, combining qualitative and quantitative data. The methodology includes 1) questionnaires to gather demographic data and information about participants understanding of visual literacy concept and its components; 2) visual analysis collected as qualitative data during the individual interviews and later processed within an Inquiry Graphic (IG) framework.

Inquiry Graphic (IG) model is a semiotic analytical framework for doing research with photographs. IG provides a framework for different image interpretations which are based on interpreters' previous experience, education level, cultural background, value systems, and other influencing factors. IG helps to bring the example of semiotic tools in media corresponding with visual literacy theories about the complexity and power of visual language, meaning its descriptive interpretations as denotation and connotation descriptions. Lackovic IG model is based on the sign interpretation method – Triadic Model – created by Peirce (1931-58), one of the founders of semiotic tradition. For the analysis, three characteristic parameters are distinguished – Representamen (the digital photographic form), Object (what the photo resembles), and Interpretant (photographic meaning). The steps of inquiry graphics (Lackovic, 2020) consist of: 1) digital materiality (embodied representamen); 2) descriptive interpretations as denotation and connotation descriptions; 3) object of inquiry (conceptual/research/thematic object, what the photograph refers to in conceptual and theoretical inquiry terms).

The methodology included the use of visual evidence. According to Matusiak (2020) the use of visual evidence is common in studying visual literacy. Researching visual literacy data can be collected in different forms of representation. In addition to textual and numeric data, researchers choose to use visual resources in the research process and collect data

in visual form. (Matusiak, 2020). Visual evidence includes photography, historical archival imagery, contemporary media images, manipulated imagery, video stills, computer graphics, etc.

This study aimed to examine the understanding of the visual literacy concept among the Riga Art and Media school Photography design program final year students, by analysing student responses to visual material considering the content and the context of the chosen imagery according to (Lackovic, 2020) Inquiry Graphic (IG) model. For this study, the author conducted interviews based on visual evidence with 27 students-final year graduates of the Photo-design specialty of Riga Art and Media school. Data were collected from January to February 2021. Students were informed about the research during the study process and those who agreed to participate in the interviews, agreed to the data processing in the online application form.

The primary data collection techniques included: 1) questionnaires to gather demographic data and information about students' understanding of visual literacy and some of its characteristic components. Questionnaire consist of 7 questions: demographic question, closed-ended questions, open-ended questions and Likert scale questions; 2) visual evidence, collected and organized for a display by the researcher. The visual imagery was collected from an internet news and private media sources. Respondents (Interpreters) were asked to describe the image in the context provided; 3) Interviews provided qualitative data on visual literacy skills (visual reading skills) and vocabulary according to Lackovic (2020) Inquiry Graphic model.

Results

The results are based on the analysis of two sources of data: questionnaire responses and visual analysis. The questionnaire responses indicate that 19 participants are familiar with the concept of visual literacy, from which 12 participants are familiar with both (Latvian and English term of it) while 8 are familiar only with an English term and 7 participants replied of not being familiar with visual literacy concept or term at all. When asked to evaluate the importance of digital visual content in the education process, 23 replied that it is very important, 3 replied as important, and 1 moderately important. From the responses about digital image processing programs they manage, all participants indicated Adobe Photoshop, almost all indicated Adobe Lightroom, some participants listed other programs as CaptureOne, FastStone, Paint, Snapseed, Microsoft Images, DarkTable, Affinity, GIMP, Corel Draw, Boris FX, Picasa, Portrait un Body Pro, Affinity AI, Afterlight, PicsArt, Snapseed. While Adobe Photoshop and Adobe Lightroom are study tools, other programs are mainly self-taught.

11 participants think that knowledge acquired at school of image-making and post-processing nuances is very important for a more critical assessment of visual online media content, 8 indicate that it is important, 5 respondents indicate it as medium important, and three participant responses indicate small or no importance at all. When asked if they know how to verify the origin of digital images (for example by using google reverse image search), 21 participants knew (from them only 8 have actually used it), while six participants didn't know about this or other similar tools. When asked if they manage their own photography metadata, everyone knew how to do that, but less than a half (16 respondents) reported doing it regularly. Respondents were provided with an image Fig 1. and asked if they can trace and identify what kind of portraits are those agreeing with one of the possible answers: 1. real portraits from the photo banks; 2. nonexisting portraits, created by artificial intelligence; 3. photographs of casting agency models; 4. couldn't trace the source.

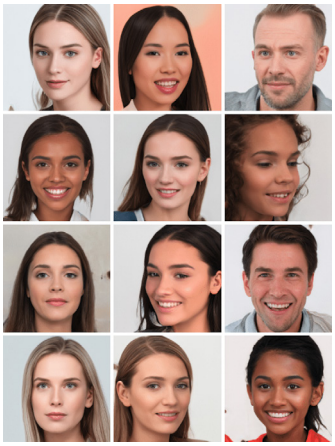

Figure 1. Image downloaded from the website https://generated.photos

As a result, 10 respondents replied as they are casting agency models, 9 identified those are nonexisting portraits, created by artificial intelligence, 7 marked those as real portraits from the photobanks, while one respondent didn't have an opinion.

During the interviews, the respondents were asked to make a statement based on the visual evidence and to conduct the visual analysis of the provided visual imagery. Embodied representamen, in this case, was a digital image, a screenshot from the Latvian online news media channels. The Fig. 2 dispalys the combination of two screenshot imageries– from two different news channels, portraying a politician.

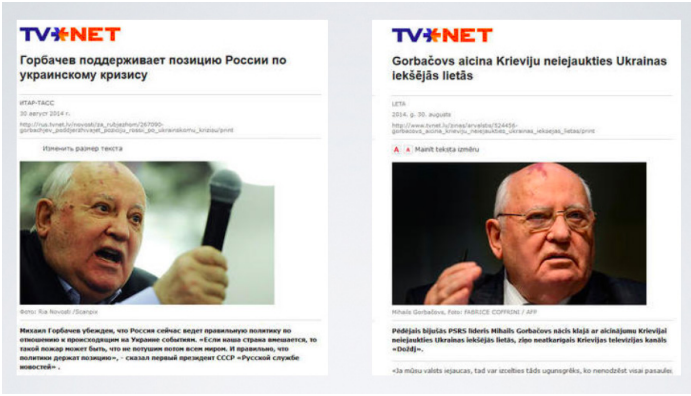

Figure 2. Screenshot from two local news channels: tvnet.lv and rus.tvnet.lv

Respondents were asked, if different image use change the perception of the news content? Majority (24 respondents) agreed with a statement that the same persons portrait, presented by using different visual language, evoke different emotions and this changes the perception of news content. One respondent replied that, even though it evokes different emotions to the viewer, it doesn't affect the perception of the content. While two respondents didn't see a difference, why two images could create a different perception of the news content.

Further, the findings on visual reading are provided with an Inquiry Graphic (IG) as a framework for the analysis. Participant (Interpreter) response to digital image content is transcribed into two categories:

1) descriptive interpretations as denotation (D) and connotation descriptions (C) – object description, associations, symbolic meaning, feelings that arise from seeing the image;
2) object of inquiry (meaning, what the photograph refers to in conceptual and theoretical inquiry terms, according to the interpreter) – assumptions, statements, interpretation.

Fig. 3. displays a screenshot image from a local news channel portraying a dark military protection helmet covered with snowflakes and a faded cityscape for a background and a textual headline – "Russia is ready to disconnect from the Internet, Medvedev says". Interpreters were asked to describe the image accordingly to the headline.

The visual analysis consist of the denotation (D) descriptions together with connotation (C) descriptions and statements, interpretations of the digital image as conceptual object, as well as vocabulary used for image description.

Figure 3. Screenshot from the local news channel: tvnet.lv

According to responses 2 interpreters used only denotation (D) description naming the object (helmet) or a person wearing a helmet, 1 interpretent didn't develop any descriptions, 14 interpreters applied connotation (C) descriptions, using such vocabulary as "*gives/creates a feeling of distancing/alienation/isolation*" and "*symbolizes/represents closure/protection/seclusion/isolation/contro*l" while 8 interpreters used both – denotation (D) and connotation (C) descriptions, including the ones like "*being behind the mask means no one sees me and no one hears me*" "*helmet hides privacy*" "*helmet refers to control*" "*It symbolises seclusion, being distanced*, "*Mask as a symbol for hiding, protection, resistance*".

From 27 interpreters 17 described the photograph as conceptual object, expressing their assumptions, attitudes, statements and interpretations like "*if person is outside of social networks, he is less recognisable and, and less informed*" "*Indicates a full information control by the state*" "*Indicates the possibility of protests and unrest*" *Being without internet would mean disturbed communication which would leave everyone in its own bubble.*" Two interpreters marked the image as inappropriate.

Discussion

Digital education transformation foresees the management of the educational process by using digital visual tools. The role of educators is to introduce students to the complexities of digital visual media and guide the process of cognition and education of visual literacy competencies, including both – 'responding' to digital visual imagery and 'producing' digital visual imagery. The study was conducted by interviewing Riga Art and Media school final year students to learn their comprehension of the main components of the visual literacy concept and terminology, as well as their ability to describe a digital photograph at the denotative and connotative level and as an object representing a certain concept.

The findings of this study reveal that many respondents were not familiar with the visual literacy concept. It reflects the notion of the vocational study program that is mainly targeted to enhance technical skills in photography, leaving many other aspects of visual literacy not covered during the study process. Almost every respondent agreed that digital visual content in the education process is very important. All participants indicated Adobe Photoshop as the main image processing program they have been using. Less than a half of respondents admitted that knowledge acquired at the school of image-making and post-processing nuances is very important for a more critical assessment of visual online media content, others indicate it as important or medium important or having no importance at all. The answers suggest the learning content might not be associated with everyday life situations. Asked if respondents know how to verify the origin of digital images (for example by using google reverse image search), more than half knew about the tool and only few actually new how to practically use it. A good tendency is students' understanding of photographic metadata, though less than a half of respondents reported managing metadata regularly for their photographs.

Digital images circulating in online media can be described in different levels – due to their digital materiality, description at denotative and connotative level, and as an object of inquiry. Inquiry Graphic (IG) is a very applicable approach to reflect on the findings on visual reading skills by students that helps to assess not only the various descriptive interpretations but also to get an insight into students' perception of photography as a conceptual object. This study shows that in interactions with digital imagery, students' ability to read images as information resource varies. None of the interpreters limited their answers only to the denotative meaning as most common answers included the combination of both, decoding images with denotative and connotative description. Most common descriptions were built upon its connotative meaning, expressing the associations, feelings, and symbolic representations of the objects in the photograph. More than a half-developed their connotative descriptions towards photograph as conceptual object, expressing their assumptions, attitudes, statements, and interpretations, thus forming their personal opinion that is composed solely on image interpretations within a given context.

According to Messaris (1994) there are visual compositional tools (for example, the angle of view) used to affect viewers perceptions of the power of a person in an image. The relationship between form and meaning is one of the most regular basis of visual communication.

Supporting the use of visuals within education and provide students with a method that would help to analyse different visual imagery could promote a more critical view of digital imagery students are exposed daily.

Lackovic (2020) discusses that "photographs can act as thinking tools, as semiotic scaffoldings and semiotic bridges between abstract concepts and the physical world in an educational inquiry" (p. 444). The role of educators would be to encourage learners and introduce them to a diverse set of methods and tools to explore the complexities and plurality of concepts and visual signs that embody them. Blummer (2015) suggest that within an educational setting it is nescessary to teach visual literacy, visual literacy principles, copyright issues and guide students in the interpretation of political and scientific images.

Providing a specific media imagery in this research was intentional resonating to the Lackovic (2020) idea that digital photographs that appear on the media, such as insitutional websites or news media act as superimposed conceptual object. According to Lackovic (2020) "By doing this superimposing of concept over image, the image-concept artefact or ensemble becomes a scientific-pictorial symbol, as the photograph gains a conventionally assigned meaning for the purpose of that specific inquiry. There are no adequate or right pictures for abstract concepts or media claims. All photographs and signs need to be first objects of inquiry, and not given objects of truth. This inquiry orientation challenges the assertion of truth claims, in education, just as much as in public discourse." (p. 457)

The qualitative approach chosen for this study presents limitations to interpretations and generalizations of results. However, a qualitative study conducted within a specific educational setting provides the information on the comprehension of visual literacy and also reveals patterns and the vocabulary applied for the image analysis. The usage of visual evidence and visual methods are especially important in the visual literacy studies. Collected data in this research showed that the theoretical knowledge may be ineffective unless there is a knowledge and practical application of it everyday and especially in education setting. Further research could provide more in-depth analysis of sub-comptencies of responding to diverse set of visual material within a framework of Inquiry Graphic (IG) model.

Conclusion

Visual literacy has been conceptualized and defined in multiple ways. Contemporary visual literacy theories mainly refer to the visual literacy competencies (responding to visual imagery and producing visual imagery) within the digital environment by emphasizing the use of digital media, digital imagery, digital symbols, digital messages, and other digital visual communication tools.

As distance learning has made a significant step in the digitalization of the learning process and materials, a unified institutional framework

and pedagogical methods and tools developed within a framework are important to support and navigate educators to implement digital literacy, media literacy, and digital visual literacy learning strategies within a study process.

Information acquired within a research contributes new knowledge about the understanding of visual literacy concept amongst final year Photography design students (future media professionals) at Riga Art and Media School. Many respondents were not familiar with a concept or terminology, indicating the visual literacy concept as a novelty within an educational inquiry. While there is a great emphasis on the technical side of producing photographic content at a study level in Riga Art and Media school, many aspects of visual literacy are not covered within the study program. The majority of the focus group participants confirmed the importance of digital visual imagery in the study process and supported the idea that the knowledge acquired at the school of image-making and post-processing lead to a more critical assessment of visual media content.

Semiotic tools in visual literacy strategies refer to the complexity and multilayered aspects of visual language. Digital images circulating in online media can be described in different levels – due to their digital materiality, description at denotative and connotative level, and as object of inquiry.

From the visual analysis part the main conclusion is that more than half of respondents developed meanings of the photograph as a conceptual object, expressing their assumptions, attitudes, statements, and interpretations, thus forming their personal opinion that is composed solely of image interpretations within a given context.

A digital photograph is a visual message itself rather than an illustration for a text and being visually literate would help to navigate through the complexity of photographic meaning that has been constructed within an image, as well depending on a context of use. Further research should be conducted on academic practice and pedagogical tools to improve a person's digital visual literacy and visual media competence in a digital environment.

References

Aiello, G. (2020). Visual semiotics: Key concepts and new directions. In Luc Pauwels and Dawn Mannay (Eds.). *The SAGE Handbook of Visual Research Methods.* DOI:10.4135/9781526417015.n23

Avgerinou, M. Pettersson, R. (2011). Toward a Cohesive Theory of Visual Literacy. *Journal of Visual Literacy*, v30 n2 p1-19. DOI:10.1080/23796529.2011.11674687

Avgerinou, M. Ericson, J. (2002). A Review of the Concept of Visual Literacy. *British Journal of Educational Technology*. 28. 280–291. DOI: 10.1111/1467-8535.00035

Avgerinou, M. D. (2009). Re-viewing visual literacy in the 'Bain d'images' era. *TechTrends: Linking Research & Practice to Improve Learning*. 53(2): 28–34. DOI:10.1007/s11528-009-0264-z

Avni E., Rotem A. (2016). Digital Competence: A Net of Literacies. DOI: 10.4018/978-1-4666-9441-5.ch002

Barthes R. (1977). Elements of Semiology, New York: Hill and Wang.

Blummer, B. (2016). Some Visual Literacy Initiatives in Academic Institutions: A Literature Review from 1999 to the Present, *Journal of Visual Literacy*, 34(1), 1–34. DOI: 10.1080/23796529.2015.11674721

Brumberger, E. (2011). Visual Literacy and the Digital Native: An Examination of the Millenial Learner, *Journal of Visual Literacy*, Volume 30, Number 1, 19–46. DOI: 10.1080/23796529.2011.11674683

Chauvin, B.A. (2003). Visual or Media Literacy? *Journal of Visual Literacy*, 23(2), 119–128. DOI: 10.1080/23796529.2003.11674596

Cross-Sectoral Coordination Center (2020). *National Development Plan of Latvia 2021-2027. No.418/Lm13. Youth Policy Guidelines (2021–2027)*. Retrieved from: https://www.pkc.gov.lv/sites/default/files/inline-files/NAP2027_ENG.pdf

European Commission (2020). *Digital Education Action Plan (2021–2027)*. Retrieved from https://ec.europa.eu/education/education-in-the-eu/digital-education-action-plan_en

Kedra, J. (2018). What does it mean to be visually literate? Examination of visual literacy definitions in a context of higher education, *Journal of Visual Literacy*, 37(2), 67–84, DOI: 10.1080/1051144X.2018.1492234

Kedra, J. Zakeviciute R. (2019). Visual literacy practices in higher education: what, why and how? *Journal of Visual Literacy*, 38(1–2), 1–7. DOI: 10.1080/1051144X.2019.1580438

Lackovic, N. (2020), Thinking with Digital Images in the Post-Truth Era: A Method in Critical Media Literacy. *Postdigital Science and Education*, 2, 442–462. DOI: 10.1007/s42438-019-00099-y

Matusiak, Krystyna K. (2020). Studying visual literacy: Research methods and the use of visual evidence" *International Federation of Library Associations and Institutions*, Vol. 46(2), 172–181.

Matusiak, K., Heinbach, C., Harper, A., & Bovee, M. (2019). Visual Literacy in Practice: Use of Images in Students' Academic Work. *College & Research Libraries*, 80(1). Messaris, p. (2012) Visual "Literacy" in the Digital Age. *Review of Communication*, 12(2), 101–117. DOI: 10.1080/15358593.2011.653508

Messaris, P. (1994). Visual Literacy vs. Visual Manipulation. *Critical Studies in Mass Communication*, 11(2), 181–203. DOI: 10.1080/15295039409366894

National Center for Education (2016–2023). *Competency based curriculum (School 2030)*. Retrieved from: https://www.skola2030.lv/

Organisation for Economic Co-operation and Development. (2018). *Future of Education and Skills 2030*. Retrieved from: https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

Schönau, D., Kárpáti, A., Kirchner, C. & Letsiou M. (2020) European Network for Visual Literacy (ENViL) research manuscript Towards a Revised Model of the Common European Framework of Reference for Visual Competency.

Images from news media platforms tvnet.lv and rus.tvnet.lv. 30.08.2014. *Screenshot.* Retrieved from: http://www.tvnet.lv/zinas/arvalstis/524456-gorbacovs_aicina_krieviju_neiejaukties_ukrainas_ieksejas_lietas, http://rus.tvnet.lv/novosti/za_rubjezhom/267090-gorbachjev_poddjerzhivajet_poziciju_rossii_po_ukrainskomu_krizisu

Image from news media platform delfi.lv. 01.02.2021. *Screenshot.* Retrieved from: https://www.delfi.lv/news/arzemes/krievija-ir-gatava-atslegties-no-interneta-pazino-medvedevs.d?id=52892933

Image from the AI generated photograpy website. 02.02.2021. Retrieved from: https://generated.photos