



iCERI 2019

**12TH INTERNATIONAL CONFERENCE OF
EDUCATION,
RESEARCH AND
INNOVATION**



CONFERENCE PROCEEDINGS

**SEVILLE (SPAIN)
11-13 NOVEMBER 2019**



**12TH INTERNATIONAL CONFERENCE OF
EDUCATION,
RESEARCH AND
INNOVATION**

**CONFERENCE
PROCEEDINGS**

**SEVILLE (SPAIN)
11-13 NOVEMBER 2019**

Published by
IATED Academy
iated.org

ICERI2019 Proceedings
12th International Conference of Education, Research and Innovation
November 11th-13th, 2019 — Seville, Spain

Edited by
L. Gómez Chova, A. López Martínez, I. Candel Torres
IATED Academy

ISBN: 978-84-09-14755-7
ISSN: 2340-1095
V-2804-2019

Book cover designed by
J.L. Bernat

All rights reserved. Copyright © 2019, IATED

The papers published in these proceedings reflect the views only of the authors. The publisher cannot be held responsible for the validity or use of the information therein contained.

ICERI2019 COMMITTEE AND ADVISORY BOARD

<i>Adriana Agnes Repellin-Moreno</i>	MEXICO	<i>Jose F. Cabeza</i>	SPAIN
<i>Agustín López</i>	SPAIN	<i>Jose Luis Bernat</i>	SPAIN
<i>Aileen Cotter</i>	IRELAND	<i>Joyce Malyn-Smith</i>	UNITED STATES
<i>Alan Belcher</i>	UNITED STATES	<i>Juanan Herrero</i>	SPAIN
<i>Alexandru Marin</i>	ROMANIA	<i>Judith Szerdahelyi</i>	UNITED STATES
<i>Alia Ammar</i>	UNITED STATES	<i>Julian Busse</i>	GERMANY
<i>Amparo Girós</i>	SPAIN	<i>Julie Byrne</i>	IRELAND
<i>Ana Henriques</i>	PORTUGAL	<i>Laila Nordstrand Berg</i>	NORWAY
<i>Ana Paula Lopes</i>	PORTUGAL	<i>Lamyá Amleh</i>	CANADA
<i>Ana Tomás</i>	SPAIN	<i>Laurie Henry</i>	UNITED STATES
<i>Anna Romagnuolo</i>	ITALY	<i>Liisa Wallenius</i>	FINLAND
<i>Anne Brasier</i>	JAPAN	<i>Linda Colburn</i>	UNITED STATES
<i>Antonio García</i>	SPAIN	<i>Lorena López</i>	SPAIN
<i>Breno Deffanti</i>	BRAZIL	<i>Lori Severino</i>	UNITED STATES
<i>Brian Garibaldi</i>	UNITED STATES	<i>Luca Botturi</i>	SWITZERLAND
<i>Catherine O'Donnell</i>	UNITED KINGDOM	<i>Lucilia Falcao</i>	BRAZIL
<i>Chelo González</i>	SPAIN	<i>Luis Gómez Chova</i>	SPAIN
<i>Christian Grévisse</i>	LUXEMBOURG	<i>Luis Roseiro</i>	PORTUGAL
<i>Christopher Evans</i>	UNITED KINGDOM	<i>Lynn Vona</i>	UNITED STATES
<i>Christopher Mattatall</i>	CANADA	<i>M. Karina Maldonado-Mariscal</i>	SWITZERLAND
<i>Craig Loewen</i>	CANADA	<i>M^a Jesús Suesta</i>	SPAIN
<i>Cynthia Rosas Magallanes</i>	MEXICO	<i>Maria Porcel</i>	SPAIN
<i>Daniel Abrahams</i>	UNITED STATES	<i>Martha Leal-Gonzalez</i>	MEXICO
<i>Darius Singh</i>	NEW ZEALAND	<i>Matthias Rath</i>	GERMANY
<i>David Jennings</i>	IRELAND	<i>Mayaugust Finkenberg</i>	UNITED STATES
<i>David Martí</i>	SPAIN	<i>Michael Flannery</i>	IRELAND
<i>Detta Melia</i>	IRELAND	<i>Miguel Peiró</i>	SPAIN
<i>Dorota Anna Krawczyk</i>	POLAND	<i>Miranda Lin</i>	UNITED STATES
<i>Eduardo Figueira</i>	PORTUGAL	<i>Norma Barrachina</i>	SPAIN
<i>Eladio Duque</i>	SPAIN	<i>Paul Fenn</i>	UNITED KINGDOM
<i>Elizabeth Franklin</i>	UNITED STATES	<i>Paul Lane</i>	UNITED STATES
<i>Elmaziye Özgür</i>	CYPRUS	<i>Peter Gabor</i>	CANADA
<i>Emily Thrush</i>	UNITED STATES	<i>Peter Haber</i>	AUSTRIA
<i>Ewa Bogacz-Wojtanowska</i>	POLAND	<i>Peter Mazohl</i>	AUSTRIA
<i>Faye Taylor</i>	UNITED KINGDOM	<i>Pia Palotie</i>	FINLAND
<i>Fernando Enrique Ortiz Rodriguez</i>	MEXICO	<i>Remigijus Bubnys</i>	LITHUANIA
<i>Francesca Maria Ugliotti</i>	ITALY	<i>Robert Shea</i>	CANADA
<i>Francesco Galati</i>	ITALY	<i>Rosa Cendros Araujo</i>	CANADA
<i>Gudrun Marci-Boehncke</i>	GERMANY	<i>Salman Azhar</i>	UNITED STATES
<i>Halvard Øysæd</i>	NORWAY	<i>Sergio Pérez</i>	SPAIN
<i>Helena Rodrigues</i>	PORTUGAL	<i>Shannon White</i>	UNITED KINGDOM
<i>Helmut Woellik</i>	AUSTRIA	<i>Sinead McCotter</i>	UNITED KINGDOM
<i>Hiroyuki Obari</i>	JAPAN	<i>Sylvia Dempsey</i>	IRELAND
<i>Ieva Brence</i>	LATVIA	<i>Taija Votkin</i>	FINLAND
<i>Ignacio Ballester</i>	SPAIN	<i>Taketoshi Yokemura</i>	JAPAN
<i>Ignacio Candel</i>	SPAIN	<i>Tammy Ladwig</i>	UNITED STATES
<i>Irène Bernhard</i>	SWEDEN	<i>Terry Filer</i>	UNITED KINGDOM
<i>Iván Martínez</i>	SPAIN	<i>Thomas Lavery</i>	UNITED KINGDOM
<i>Jaroslawn Kujawski</i>	POLAND	<i>Vic Lally</i>	UNITED KINGDOM
<i>Javier Domenech</i>	SPAIN	<i>Victor Fester</i>	NEW ZEALAND
<i>Javier Martí</i>	SPAIN	<i>Victor Harari</i>	MEXICO
<i>Jenny Eppard</i>	UNITED ARAB EMIRATES	<i>Victoria Kompanets</i>	FINLAND
<i>Joanna Lees</i>	FRANCE	<i>Wendy Gorton</i>	UNITED STATES
<i>Joanna Richardson</i>	UNITED KINGDOM	<i>Xavier Lefranc</i>	FRANCE
<i>John Craft</i>	UNITED STATES	<i>Xema Pedrós</i>	SPAIN

CONFERENCE SESSIONS

ORAL SESSIONS, 11th November 2019

Interactive Learning Environments
Flipped Learning
Game-based Learning and Gamification (1)
University-Industry Cooperation (1)
21st Century Skills
Student Support and Motivation (1)
Special Education (1)
3D Design Learning
Problem Based Learning (1)
An International View on the Transformative Value of Prison Based Educational Programs

Robots for Learning
Flipped Learning in STEM
Game-based Learning and Gamification (2)
Blended Learning (1)
Technology Enhanced Learning
Teacher Training in STEM
Inclusive Education Challenges (1)
Architecture Educational Experiences
Problem Based Learning (2)
Primary and Secondary Education

Virtual and Augmented Reality (1)
Critical Thinking
Teacher is Present! – Guidance and Feedback in Online Language Learning
Problem and Challenge Based Learning
Assessment of Student Learning
Professional Development of Teachers (1)
Inclusive Education Challenges (2)
Engineering Education
ICT for Language Learning
Early and Primary Education

Virtual and Augmented Reality (2)
Pedagogical Innovations
Game-based Learning and Gamification (3)
Active Learning Experiences
Peer Assessment Experiences
Professional Development of Teachers (2)
Universal Design for Learning
Teaching Programming and Coding Skills
Foreign Language Learning (1)
Student Support and Motivation (2)

POSTER SESSIONS, 11th November 2019

New Trends and Experiences in Education

Technology in Education and Research

ORAL SESSIONS, 12th November 2019

Design Thinking and Creativity
Links between Education and Research
Education for Sustainability
Accreditation and Quality in Education
e-Learning Experiences (1)
Digital Literacy and ICT Skills (1)
ICT Skills among Teachers (1)
Game-based Learning in Primary and Secondary
Foreign Language Learning (2)
Health Sciences Education (1)

Learning Analytics
Internships and Workplace Learning
Service Learning
New Challenges for the Higher Education Area
Online Assessment
Challenges of Digitalization in Education
ICT Skills among Teachers (2)
Cultural Literacy and Intercultural Understanding
Foreign Languages for Special Purposes
Health Sciences Education (2)

Learning Management Systems
Bridges between Education and Employment
Tutoring and Mentoring
University-Industry Cooperation (2)
Digital Literacy and ICT Skills (2)
Adult Education
ICT Skills among Teachers (3)
Multicultural Education Challenges
Pre-service Teacher Experiences
Computer Science Education

Videos for Learning
Business Education
Student Support and Wellbeing (1)
Language Learning Challenges and Innovations (1)
Students and Teaching Staff Exchange Programmes
Lifelong Learning and Continuing Education
Teacher Training Experiences
Special Education (2)
Professional Development of Language Teachers
STEM Education (1)

m-Learning: Mobile Applications and Technologies
Blended Learning (2)
Student Support and Wellbeing (2)
Leadership and Educational Management
e-Learning Experiences (2)
Distance Education
Gender and Equality in Education
Educating At-Risk Students
Language Learning Challenges and Innovations (2)
STEM Education (2)

POSTER SESSIONS, 12th November 2019

Pedagogical Innovations

Challenges in Education

VIRTUAL SESSIONS

21st Century Skills
Academic Research Projects
Accreditation and Quality in Education
Active and Experiential Learning
Adult Education
Advanced Classroom Applications and Technologies
Assessment of Student Learning
Barriers to Learning
Blended Learning and Flipped Classroom
Collaborative and Problem-based Learning
Community Engagement and Youth participation
Creativity and Design Thinking
Critical Thinking and Problem Solving
Curriculum Design
E-content Management and Development
e-Learning Experiences
Early Childhood Education
Educating Individuals with Intellectual Disabilities
Educating Individuals with Sensory and Motor Disabilities
Educating the Educators
Education for Sustainability
Education Practice Trends and Issues
Education, Research and Globalization
Educational/Serious Games and Software
Employability Issues and Trends
Erasmus+ Programme Experiences
Flipped Learning
Game-based Learning and Gamification
Gender and Equality in Education
ICT and Digital Skills
ICT Skills Development
In-service Teacher Training
Inclusive Learning, Cultural Diversity and Special Education
Informal Learning
International Projects
Language Learning Innovations
Leadership and Educational Management
Learning and Teaching Innovations
Learning Management Systems (LMS)
Life-long learning
Links between Education and Research
m-Learning: Mobile Applications and Technologies
Massive Open Online Courses (MOOC)
Multicultural Inclusion and Indigenous Perspectives
New challenges for the Higher Education Area
Open Universities and Distance Education
Pedagogical Innovations
Post-graduate Education
Pre-service Teacher Experiences
Primary and Secondary Education
Professional Development of Teachers
Refugees, Migrants and Minorities Inclusion
Research Methodologies
Research on Technology in Education
STEM Education Experiences
Student Support and Motivation
Students and Teaching Staff Exchange Programmes
Technology in Teaching and Learning
Tutoring and Mentoring
Undergraduate Education
Universal Design for Learning
University-Industry Cooperation
Videos for Learning and Educational Multimedia
Virtual and Augmented Reality
Virtual Learning Environments (VLE)
Vocational Training
Web 2.0 and Social Networking

ABOUT ICERI2019 Proceedings

HTML Interface: Navigating with the Web browser

This USB Flash drive includes all presented papers at ICERI2019 conference. It has been formatted similarly to the conference Web site in order to keep a familiar environment and to provide access to the papers through your default Web browser (open the file named "ICERI2019_Proceedings.html").

An Author Index, a Session Index, and the Technical Program are included in HTML format to aid you in finding conference papers. Using these HTML files as a starting point, you can access other useful information related to the conference.

The links in the Session List jump to the corresponding location in the Technical Program. The links in the Technical Program and the Author Index open the selected paper in a new window. These links are located on the titles of the papers and the Technical Program or Author Index window remains open.

Full Text Search: Searching ICERI2019 index file of cataloged PDFs

If you have Adobe Acrobat Reader version 6 or later (www.adobe.com), you can perform a full-text search for terms found in ICERI2019 proceedings papers.

Important: To search the PDF index, you must open Acrobat as a stand-alone application, not within your web browser, i.e. you should open directly the file "ICERI2019_FrontMatter.pdf" with your Adobe Acrobat or Acrobat Reader application.

This PDF file is attached to an Adobe PDF index that allows text search in all PDF papers by using the Acrobat search tool (not the same as the find tool). The full-text index is an alphabetized list of all the words used in the collection of conference papers. Searching an index is much faster than searching all the text in the documents.

To search the ICERI2019 Proceedings index:

1. Open the Search PDF pane through the menu "Edit > Advanced Search" or click in the PDF bookmark titled "SEARCH PAPERS CONTENT".
2. The "ICERI2019_index.pdx" should be the currently selected index in the Search window (if the index is not listed, click Add, locate the index file .pdx, and then click Open).
3. Type the search text, click Search button, and then proceed with your query.

For Acrobat 9 and later:

1. In the "Edit" menu, choose "Search". You may receive a message from Acrobat asking if it is safe to load the Catalog Index. Click "Load".
2. A new window will appear with search options. Enter your search terms and proceed with your search as usual.

For Acrobat 8:

1. Open the Search window, type the words you want to find, and then click Use Advanced Search Options (near the bottom of the window).
2. For Look In, choose Select Index.
3. In the Index Selection dialog box, select an index, if the one you want to search is available, or click Add and then locate and select the index to be searched, and click Open. Repeat as needed until all the indexes you want to search are selected.
4. Click OK to close the Index Selection dialog box, and then choose Currently Selected Indexes on the Look In pop-up menu.
5. Proceed with your search as usual, selecting other options you want to apply, and click Search.

For Acrobat 7 and earlier:

1. In the "Edit" menu, choose "Full Text Search".
2. A new window will appear with search options. Enter your search terms and proceed with your search as usual.

APPLICATION OF PHOTOGRAPHY IN VISUAL LITERACY EDUCATION IN THE PROFESSIONAL FIELD “PUBLIC COMMUNICATIONS AND INFORMATION SCIENCES”

Kamelia Planska-Simeonova

University of Library Studies and Information Technologies (BULGARIA)

Abstract

Knowledge related to visual communication is essential not only for the mass media and public communication educators, but also for humanitarian researchers. Photography is applicable in a variety of fields, making it an essential tool in visual communication. At present time, anyone can be an author of photographic images that could be shared on the web. This report aims to summarize the use of photography in visual literacy training in the professional field of “Public Communications and Information Sciences”, maintaining the hypothesis that it is precisely through photography that the ability to create visual messages can be demonstrated and learned in practice. Creating such competences means that students learning media-related studies, journalism, management, book publishing, archival work, in a real work environment, can apply the learned and create and share conceptually and effectively quality electronic content in the form of photographic images. In the course of the study, the specific features of photography are distinguished as a method of reproducing reality or the use as a method for reproducing specific objects. The genres applicable to visual literacy training are differentiated according to the professional competence of the students. The advantages and disadvantages of applying photography to visual literacy are outlined.

Keywords: photography, visual communication, competences.

1 INTRODUCTION

Technological advances in the 21st century have an impact on how students spend their time and how they perceive the significant amount of information they have access to on a daily basis through the World Wide Web. The current learning process is aimed at creating a strategy for processing and analyzing the huge digital flow of information, on the one hand, and on the other, it is important to pay attention to the skills, needed to use digital resources effectively.

Each teacher has a different model and tools through which to educate his students, depending on the discipline he/she teaches. Often, a curriculum in a discipline involves theoretical preparation, which consists of teaching lecture material presented in the form of presentations. The presentations themselves may contain text but also illustrative material to serve as a visual example. One of the appropriate ways to engage students in the learning process is through the creation of author texts or graphic images related to the learning content, conducting collective discussions, and the useful method of learning by doing.

Each student perceives the educational content in a different way. The main role of the teacher is not only to impart knowledge but also to prepare the trainees for their future professional realization. Therefore, it is necessary to create specific skills that can be applied outside the university environment.

Photography is one of the tools through which education can be extended beyond the university. Photography is a pedagogical tool for developing reading and writing skills of students enrolled in high school [1] but also of students in various professional fields, such as Public Communications and Information Sciences. In the last decade, studies have also been done in the field of digital visual literacy (DVL), which is applicable in the fields of Cultural Context, Communication, Computer Graphics and Commerce. Digital visual literacy can be defined as the ability to access, analyze, evaluate, and communicate information in a digital format that engages the cognitive processing of a visual image. It is the ability to create and interpret computer-based visual materials effectively and has become a key aspect of virtually every field, from the sciences to commerce to communication and entertainment. Digital Visual Literacy and Computer Literacy intersect with each other. Digital visual literacy is required in a wide range of workplace tasks, from interacting with today's computer applications to using a digital camera, sharing images, making a website, creating presentations,

understanding medical scans, and visualizing data in a wide range of fields. DVL is also essential in visually oriented fields such as architecture, industrial design, film and video, and photography. [2]

Why exactly photography? Everyone can take photos; no professional photography education is required to take pictures. Anyone who likes to take pictures can become an amateur (non-professional) photographer. Digital photography, on the other hand, implies that the person who took the photo to undergo further processing, which involves the use of specialized software or technology and the skills to work with them. Passing specialized photography education that introduces students to compositional principles, perspective, use of lighting (natural or artificial), choice of perspective, etc., contributes to the development of visual literacy and visual thinking.

Visual literacy has been learned since childhood, and literacy through photography (LTP) continues to develop its application. This method was developed by Wendy Ewald. According to Duke University's Center for Documentary Studies, "LTP is a teaching philosophy and methodology that encourages children to explore their world as they photograph scenes from their own lives and to use their images as catalysts for verbal and written expression." [3] According to Bamford – The teaching implications of visual literacy include the necessity to: - integrate visual literacy across all curriculum areas; - develop critical thinking skills in connection to visual images; - be aware of visual literacy principles in the design of teaching and learning objects; encourage students to look at underlying assumptions that are the way to the images surrounding young people'; - ensure there is a balance between visual and textual literacies in the classroom. [4]

Examples of application of photography in the educational process but in secondary education can be seen in the FotoFest training program (1987) [5]; eTwinning, part of ERASMUS + [6], and in the Viewfinder project [7]. Examples of the practical application of photography programs among students in various educational fields, such as architecture [8] and medicine, also testify to the practical application of photography.

2 METHODOLOGY

Digital photography is available to anyone with photo technology. It is a means by which reality can be interpreted from an individual's point of view. i.e. the same object can be interpreted differently depending on the visual literacy of the photographer. The report presents the hypothesis that it is precisely through photography that the ability to create visual messages can be demonstrated and learned in practice. Creating such competencies means that students learn media-related studies, journalism, management, book publishing, archival work, in a real work environment, can apply the learned and create and share conceptually and effectively quality electronic content in the form of photographic images.

The study found that photography is a multidisciplinary approach to teaching and learning that combines theoretical literacy education and practical photography training. Photography is related to visual literacy, which in turn has three components: (1) learning; (2) thinking; and (3) communicating. A "literate" person is able to decipher the basic code and syntax, interpret the signs and symbols, correctly apply terms from an academic discipline or field of study, understand how things fit together, and do appropriate work. Visual "information" literature is the ability to understand, evaluate, and use visual information. [9]

3 RESULTS

Some examples of visual literacy courses include those following in the steps of Professor Bob McKim's "Visual Thinking" course (McKim 1980); courses using Professor Edward Tufte's widely read series of books (Tufte 1997); interdisciplinary design and technology courses at schools such as Brown University and MIT's Media Lab, and multimedia literacy programs such as that at USC's Institute for Multimedia Literacy [IML]. [2]

According to Elliot W. Eisner argues that the arts have an important – and dare I say it – ESSENTIAL role in how we develop has humans and students by providing multiple ways of thinking critically and creating as a part of cognitive development. [10]

According to Marva Cappello, photographic workshops, part of the curricula encourage students' activity, and serve as an alternative tool for expressing ideas and understandings. Using photography leads to a meaningful learning experience. [11]

3.1 Specific features of photography

The specific features of photography are similar to the principles of painting and graphics. These are: composition, projection, volume, spatial development, illumination, perspective, focus used in the composition of individual objects. Photography is a momentary and analytical art, creating an image of an object of reality. In photography, fragmentation is possible, i.e. to portray parts of the whole. Its main distinguishing feature in terms of painting and graphics is its documentation – an objective representation of reality, without gross interference with the processing of the image with other software, and distortion and modification of the captured object. Another characteristic feature of photography is the imagery that is obtained as a result of the photographer's pre-training regarding the aesthetics of the subject / object.

The genres in photography are basic and mixed. **The main genres** are portrait, landscape, nude photography, household photography, still life, and so-called **Mixed genres** are architectural photography, business photography, sports photography, spectacle photography.

There is so-called "applied photography" and this applied photography is directly related to a specific practical purpose in the field in which it is applicable. An example of applied photography is its use as illustrative material in a print edition, such as books or periodicals – the photographs used are called photo illustration, graphic cover, cover, photo poster, photo montage, photo cartoon, photographic, photo advertising.

Specific features of photography as a method of recreating reality are composition, the semantic centre, objects selection, lighting, perspective, movement. In addition, knowledge of the effects of colours, shapes and space needs to be exercised.

With the photographic method, reproductions of rare and valuable objects can be made, such as old printed books, archival documents, works of art and graphics, etc. To capture such objects efficiently and accurately, it is necessary to have photographic literacy, i.e. the shooter to use specific methods to create the reproduction. Table 1 summarizes the application aspects of photography and its application results.

Table 1. Aspects of application of photography in education.

	<i>Aspects of application of photography</i>	<i>Results</i>
One	Cultural Context	Tracking the relationship between digital images, subsequent analysis in Cultural Context
Two	Communication	Based on art and design concepts through which learners can create effective visual messaging using computer-based tools
Tree	Computer Graphics	Knowledge of technologies, i.e. working with specialized software and practical tasks in computer graphics
Four	Commerce	Focuses on the impact of digital tools, services and content offered as commercial products or used in the workplace

Source: Prepared by the author

3.2 Creation and development of educational and scientific facilities for documentary and applied photography as part of the training of students in the professional field 3.5 "Public communications and information sciences"

In the professional field "Public Communications and Information Sciences" at ULSIT are trained specialists in library sciences, library and information management, print communications, public policies and practices, communications and informing, tourism information resources, archival studies and documents, and more. The curricula of these specialties also include disciplines that are related to the development of students' digital and information literacy, but there is no discipline that studies visual literacy. This is a major drawback, because internationally speaking, visual literacy education at universities is of paramount importance. i.e. it is also an education offering emotion and experience.

In 2019, a project funded by the Bulgarian National Science Fund, entitled: Creation and development of educational and scientific facilities for documentary and applied photography as part of the training of students in the professional field 3.5 "Public communications and information sciences" started. The main objective of the project is research and practical activities related to the Formation of Visual Literacy of students who are trained in specialties in the professional field "Public Communications and Information Sciences" at ULSIT in hours of documentary and applied photography. The project will explore, analyse and summarize the sophisticated nature of visual literature and propose a concept for further improvement. That is why the development of a new discipline tailored to the students' professional background and the creation of a learning base is a step in the right direction to promote creativity, innovation and research. In addition to the creation of a scientific-educational base, the project also prepares educational content in the discipline "Visual Literacy and Visual Thinking", that aims to prepare theoretically and practically students learning in the professional field "Public Communications and Information Sciences" at ULSIT.

The use of photography in higher education would lead to students being involved in seminars that have an impact on their creativity, as well as changing the way they learn the educational material. Turning students into authors of content contributes to developing their critical thinking, their ability to analyse, argue, and their estate to present author's work and ideas. Literacy can therefore be not only informative but also practical.

Table 2 provides an example diagram of the stages in visual literacy education through photography. They are offered at three levels: basic knowledge, more knowledge and concrete skills, introduces more advanced skills, additional knowledge areas, and continued.

Table 2 Stages of Visual Literacy education in educational and scientific facilities for documentary and applied photography in ULSIT.

Level	Level of Knowledge	Expected Results
Level 1	BASIC KNOWLEDGE (particular the introductory course)	Knowledge of Visual aids in photography (tone, tonal range, lighting, initial instruction in working with photographic techniques), principles of photocomposition, genres in photography
Level 2	ADDITIONAL KNOWLEDGE AND CONCRETE SKILLS (Photographic image analysis capabilities, the ability to read the message of the photograph, the impact of the image on the emotions of the recipient)	Knowledge of contemporary trends in photography. Developed abilities in visual thinking, interpretation, evaluation of aesthetic and artistic impact of individual photography.
Level 3	INTRODUCES MORE ADVANCED SKILLS, ADDITIONAL KNOWLEDGE AREAS, AND CONTINUED (Practical Skills)	Creating a self-contained photographic work

Source: Prepared by the author

Table 3 shows schematically an exemplary model of practical exercises in educational and scientific facilities for documentary and applied photography, consistent with the exemplary levels and competencies presented in Table 2.

Table 3. Model for practical exercises in educational and scientific facilities for documentary and applied photography in ULSIT.

		<i>Main tasks during the exercises</i>	<i>End Result</i>
One	Fine-expressions in photography	<ul style="list-style-type: none"> • Tone and tonal range • Lighting and shading • Initial instruction in working with photographic equipment 	<ul style="list-style-type: none"> • use of a digital camera, studio lighting and a set of applied photography; • capture coloured objects; • capture objects of different shapes and textures; • reproduction of: black and white and colour photo, whole document, part of document; • capture an object (coin, statuette, plaque, etc.); • capture each subject in a normal, low, and visible perspective; • selection of compositional solutions in accordance with Rule of thirds, Golden ratio, The Rule of Odds, Rule of Space
Two	Compositional creativity	<ul style="list-style-type: none"> • Line, figure, shape; • Rhythm; • Focus; • Perspective and image angle (direction, distance, image plans, height of point of view); • Build a light-shaded image; • Work with studio lighting. 	<ul style="list-style-type: none"> • Main types of lines – capacity of expression and analysis of their graphic qualities; • Analysis of the various imagery elements, considered to be bearers of rhythm in artistic photography; • Focus – clarity and ambiguity; • Work with art plans and foreshortening; • Types of lighting according to the application; • Light exposure.
Three	Photocomposition	<ul style="list-style-type: none"> • Search and define the segment; • Photo image composition; • Types of composite solutions. 	<ul style="list-style-type: none"> • Compliance with the requirements and principles for the composition; • Ratios, harmony and balance; • "Golden ratio"; • Balance; • Counterpoint; • Composite features of movement.
Four	Genres of photography	<ul style="list-style-type: none"> • Artistic landscape; • Photographic still life; • Architectural photography; • Sports photos; • Stage photography; • Artistic portrait; • Photojournalism. 	<ul style="list-style-type: none"> • Use of visual means for a particular genre; • Knowledge of the rules for capturing a particular subject • Principles for capturing a photo report, photo essay, photo story, photo etude, photo book, photo montage, advertising photography.

Five	Contemporary trends in photography	<ul style="list-style-type: none"> • View, read and interpret photographic images; • Content analysis in the photo; • Photography in the visual arts from the 19th century to the present day. 	<ul style="list-style-type: none"> • Analysis and discussions on the work of popular photographers and their works. • Answers to the questions: What does this photo reports; How the image complements the text; What methods were used to make the image; What happens in the photo; Is there a hidden message in the photo; What is the message of the photographer; What role does each object play in the photograph; Why the photographer chose this particular composition, point of view and lighting. • Show examples of the application of photography in the present.
Six	Creating a self-contained photographic work	Creates and manages custom photo projects	<ul style="list-style-type: none"> • prepares, implements, processes and shapes photographs from idea to final visual product.

Source: Prepared by the author

The proposed model for practical education in visual literacy through photography demonstrates the multidimensional application of photographic genres in various fields that can be used by specialists dealing with library sciences, archival studies, cultural heritage, tourism, journalism, print communications, etc.

3.3 Advantages and disadvantages of applying photography to visual literacy are outlined

Photography is the main tool for creating visual messages and conducting visual communication. The ability to create quality artistic (aesthetically pleasing) photographic images in the present leads to the effective use of visual messages and conceptual messages. Critical thinking skills such as analyzing, comparing, predicting, interpreting, and reviewing, help to make connections between images, thoughts, and words. As photography uses the techniques of the visual arts, it can be said that the creation of a photographic project is a tool through which the theoretical knowledge of visual literacy is exercised. This learning tool encourages students to increase their visual literacy through creativity.

During the practice activities with photographic techniques, each student can independently experiment with lighting, arrangement of individual objects, compositional principles, etc., which in turn motivates him to use his own knowledge and imagination to create a visual message that can be used in his field. The acquisition of basic shooting skills for different subjects has a positive effect, as if necessary, to prepare a visual message through a photograph, the principles for the construction and application of the photographic image will be respected

The disadvantages of such education are that it requires many practical exercises rather than one-off experiments. It is necessary to develop both theoretical knowledge of the concrete specifics in the shooting process and the use of different photographic equipment. On the other hand, there are some restrictions on access to photographic equipment where it is positioned in a specially adapted restricted location (for example, in the workplace).

4 CONCLUSIONS

In the 21st century, the ability to analyse audio-visual, digital and multimedia products is a form of literacy required for the writing and reading skills of the new visual generation. Although visually rich media and social networks are constantly used, students are not visually literate. Missing knowledge also affects non-verbal communication. Visual literacy helps in the learning process by creating a more effective connection between the teacher and the learner. Student competencies for the 21st century, such as visual perception, visual thinking, visual language and learning visual literacy are of great importance.

The inclusion of photography in theoretical and practical pursuits, regardless of the field in which their main interests are focused, leads to the development of analytical and critical skills of students in the historical, philosophical, cultural, semiotic aspect.

As photography directly engages the learner in the educational process, this makes such education extremely useful for schooling students to create copyrighted products (designing visual content), and therefore also directs students' interest in the intellectual aspects of photography. Creating new potentialities for creative expression is a step forward in promoting visual literacy as an essential element in education in the present and the enormous role and many-faced application of photography.

ACKNOWLEDGEMENTS

This research would not have been possible without the financial assistance of the following project: "Creation and development of educational and scientific facilities for documentary and applied photography as part of the training of students in the professional field 3.5 "Public communications and information sciences" financed by National Science Fund of the Ministry of Education and Science of the republic of Bulgaria with Contract № KP-06-M30/3 from 13.12.2018, led by Assistant Doctor Kamelia Planska-Simeonova.

REFERENCES

- [1] S. L. Caicedo Barreto, „ Photography as a Visual Literacy Tool“, June 2016, Retrieved from https://www.researchgate.net/publication/318880097_Photography_as_a_Visual_Literacy_Tool
- [2] Florence Martin, Anne Spalter, Oris Friesen, John Gibson. An Approach to Developing Digital Visual Literacy (DVL) <https://www.researchgate.net/publication/253979126>
- [3] K. Morrissey. „Literacy through Photography“, Retrieved from <https://medium.com/reading-writing-and-researching-in-a-digital-world/literacy-through-photography-ae0ad3c8f33e>
- [4] O. Duchak, „Visual Literacy in Educational Practice“, January 2014, Retrieved from https://www.researchgate.net/publication/286909809_Visual_Literacy_in_Educational_Practice
- [5] „Literacy Through Photography“. The FotoFest Learning Program, <http://home.fotofest.org/ltp-learning-program.aspx#.XX89tS4zblU>
- [6] „Photography like pedagogically too“, Retrieved from https://www.etwinning.net/files/kits/kit_1107_bg.pdf
- [7] „Photography Can Transform Students' Perspectives“, April 9, 2015, Retrieved from http://blogs.edweek.org/edweek/global_learning/2015/04/photography_can_transform_perspectives.html
- [8] S. YurtkuranTok, I. Kaplan, Y. Taneli, „Photography in architectural education“: A tool for assessing social aspects of the built environment, 6 May 2010, *Procedia - Social and Behavioral Sciences* Volume 2, Issue 2, 2010, Pages 2583-2588, Retrieved from <https://www.sciencedirect.com/science/article/pii/S1877042810004179>
- [9] D. Abilock. „Visual Information Literacy: Reading a Documentary Photograph“ // *Knowledge Quest*, v36 n3 p7-13 Jan-Feb 2008. Retrieved from <https://eric.ed.gov/?id=EJ825510>
- [10] K. Johnson, „Image vs. Words: Can't we all just get along?“, November 2014, Retrieved from <https://medium.com/reading-writing-and-researching-in-a-digital-world/image-vs-words-does-it-have-to-be-a-battle-65e08c588c5b>
- [11] M. Cappello. „Photography for Teacher Preparation in Literacy“: *Innovations in Instruction*. *Issues in Teacher Education*, Spring 2011, Volume 20, Number 1, pp. 95-108. Retrieved from <https://files.eric.ed.gov/fulltext/EJ922285.pdf>