

Visual Literacy for Education Professionals

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Abstract

Visual literacy (VL) is essential for improving the visual communication skills of graduate students who desire to develop instructional material or manage Information and Communication Technology (ICT)-mediated learning. However, in the current challenging and highly visual digital world, the Ecuadorian context needs a well-structured graduate program of VL. Indeed, promoting visually literate professionals in Education and other fields has yet to be understood as a complement to their digital competence development. This educational intervention was conducted with graduates from different areas of study who were in an ICT in an Education program. The specific content was integrated into one of the subjects. The VL training module described focuses on the themes, subtopics, and teaching methodology. The professor identified the most difficult topics for students to understand. This experience aims to help scholars, teachers, or researchers who want to perform an intervention in a similar context to make learning design and content decisions.

Keywords: visual literacy, higher education, graduate students, digital competence

Introduction

In the digital and post-pandemic educational age, people have had to learn to encode and decode linguistic and non-linguistic signs to communicate in various learning scenarios and contexts (Bodén et al., 2023; Reddy et al., 2020). The need for visually literate learners and educators is now more challenging and essential for enhancing learning and sharing academic and scientific information. However, the Ecuadorian undergraduate educational background indicated that some learners and junior professionals in the Education field needed more training to be visually competent (Huilcapi-Collantes et al., 2021).

Scholars insist that developing visual literacy skills is essential for learners in twenty-first-century higher education (Bleed, 2005; Brumberger, 2011; Hattwig et al., 2013; Kędra & Žakevičiūtė, 2019; Statton Thompson et al., 2022). Thus, this research suggests that Ecuadorian graduate programs need to integrate the content of visual literacy in knowledge areas external to Visual Communication, Graphic Design, Visual Arts, or related. In fact, visual literacy is needed to complement learners' digital competence development (Association of Research and College Libraries, 2011) because a large amount of information takes the form of images that substitute the text and "become the predominant form of communication" (Lundy & Stephens, 2015, p. 1057). Pre-service and in-service teachers and professionals in the educational field must learn to encode and decode visual information (Gómez Díaz, 2010) and picture-text messages for building, analyzing, or selecting instructional material and educational resources, managing ICT-mediated learning environments and improving visual communication skills for teaching.

This educational intervention was conducted in a public university in Ecuador in a graduate program, "Information and Communication Technologies in Education" (ICT). The professor proposed integrating the specific content into one of the subjects titled "Read and Write in Digital Environments" to understand visual literacy and its relevance in the field. Throughout this research, the visual literacy (VL) training module will focus on the content and the teaching methodology. The intervention assessment includes crucial moments of systematic observation and an analysis and evaluation of students' production. Furthermore, this research identifies the topics that became complex for students since they struggled to understand and apply that content in their assignments and tasks throughout the

module.

This experience could help teachers who want to implement a similar intervention to make decisions to help students successfully achieve a better level of VL. Moreover, it ratifies that visual literacy is a complementary and transversal process to develop the educational field's much-needed and well-known digital competence. Finally, the VL intervention's general evaluation helped the authors restructure the program outside formal education to manage the time and the themes according to their research-specific needs. This intervention was the pilot of the 5-year doctoral research: "Visual literacy for in-service teachers through Graphic Design to improve the planning and development of the learning process" (Huilcapi-Collantes, 2021).

Visual literacy as a complement of Digital Competence Development

The European Parliament recognizes digital competence as one of the eight key competencies for lifelong learning throughout life (Diario Oficial, L394, 2006), so its development has undoubtedly been the educational system's permanent occupation in recent years. In this respect, to educate the new millennium's students and help them develop the necessary competencies for the twenty-first century, it is essential to have teachers capable of guiding them on their educational journey through new media (INTEF, 2017). Therefore, it has been crucial to focus on graduates who work in the educational field and support them in developing and enhancing their digital competence for their professional purposes and teaching tasks.

On the other hand, Kárpáti & Paál states that "being visually competent means the combined use of knowledge, skills, and attitudes manifested in specific situations that require the use of visual language" (2022, p. 4). Hence, visual literacy competence is transversal in almost the entire development of digital competence because digital information is not shown or disseminated through only oral and textual language but mostly through visual language. Accessing, communicating, collaborating, or elaborating digital content with the information presented only through text or audio is almost impossible. In digital media, there is a dependence on the image, so much so that the images have taken the place of the word (Cordón, 2010) and "often function as information" (Association of Research and College Libraries, 2011, para. 6). Thus, a person required to handle visual information to achieve digital competence. Therefore, visual literacy competence is complementary to this process.

Visual literacy is not a previous or subsequent stage of digital competence development because both are paired processes. Indeed, to develop digital competence, the skills to handle visual information must also be acquired, so both competencies need to be taught and learned simultaneously.

The visual literacy educational intervention

The intervention was piloted with a group of graduate students from different fields enrolled in the "Read and Write in Digital Environments" subject. The course's general objective was: *Develop the ability to communicate effectively through textual and visual communication codes in virtual environments to improve the planning and development of the learning process.*

The course was scheduled for ten face-to-face sessions, as the institution determined. Each session is equivalent to two classes of two hours each, so the participants had four hours of face-to-face training for ten days, meaning forty hours of classes. Class sessions ran three days a week.

Participants

Participants included twenty-four students who were in the Education graduate program. The students' age was between 26 and 56 years. They were fifteen women and nine men. The participants' undergraduate degrees were diverse. See Figure 1.

Figure 1
Participants' undergraduate degrees.

Participants' undergraduate degrees		n	
Education	67%	16	11 In-service teachers 5 Other jobs than teaching
Pedagogy	4%	1	1 In-service teacher
Comunication/Marketing	8%	2	2 Other jobs than teaching
Others	21%	5	2 In-service teachers 3 Other jobs than teaching
Total	100%	24	14 In-service teachers

The sixteen participants who had completed undergraduate studies in Education had different majors: Social Science Education, Early Childhood Education, Foreign Language, and Computer Science Education, among others. However, five performed jobs besides teaching due to their work relationship with governmental and non-governmental organizations. For example, one was a supervisor of community projects, two were instructors of training programs, one developed educational resources at the Ministry of Education, and another worked as an operator in a customer service center. Consequently, only eleven participants with a Bachelor's Degree in Education work as teachers.

On the other hand, the person with a degree in Pedagogy worked as a foreign language teacher. The participant, who had a degree in Electronics Engineering, worked as a Mathematics and Computer Science teacher. The one with a degree in Pastoral Theology worked as a Religious Education teacher. The rest of the people who participated in the course worked in non-teaching activities. Thus, of the twenty-four students enrolled in this graduate program, only fourteen were in-service teachers, equivalent to 58%.

The participants' profile diversity was a factor that set the course's development from the beginning because not all were familiar with the development of educational resources and the teaching practice in face-to-face classes or virtual environments. Indeed, we learned that the student's profile in this graduate program would always be diverse because they do not exclude any applicant according to the undergraduate studies he has completed. Hence, the graduate program is not exclusive to teachers.

All participants worked and had work experience in some areas, such as Education, Communication, Computer Science, and ICT. This fact is usual in the context where the course was developed because graduate programs are expensive, so the students are expected to pay themselves for their studies while working. All participants attended classes after their usual workday, which is generally eight hours a day.

Infrastructure and equipment

The equipment is the set of necessary items for this intervention. The university's classroom had enough equipment for the course. It has a computer for the professor, a projector, and a screen. Additionally, the room is equipped with switches near the students' desks to facilitate the laptops' connection to AC power. Students could also connect with their user accounts to the university's wireless network. This intervention only required the equipment and infrastructure that the university offers.

Course content

Most of the course content was related to visual literacy. However, the curriculum's subject is "Read and Write in Digital Environments". The themes were taught to students sequentially, as shown in Table 1.

Table 1

Course themes and subtopics of the subject: Read and Write in Digital Environments.

No. Class	Themes	Sub-themes
1	The literacy concept in the 21st century	<ul style="list-style-type: none"> ● Digital illiteracy ● Social and Digital Exclusion ● New literacies and new forms of reading
2	Multiliteracies	<ul style="list-style-type: none"> ● New literacy in reading and writing ● Visual literacy ● Information literacy ● Digital literacy
3	New literacy in reading and writing	<ul style="list-style-type: none"> ● Reading and writing the textual content in virtual environments ● Multimodal text: linguistic and non-linguistic signs ● The role of images in electronic text
4	Visual literacy	<ul style="list-style-type: none"> ● Visual images perception ● Meaning, analysis, and interpretation of visual messages ● The cognitive impact of the visual message
5	Communication through visual language (I)	<ul style="list-style-type: none"> ● Principles of design for the composition of visual messages
6	Communication through visual language (II)	<ul style="list-style-type: none"> ● Rhetorical strategies to communicate with visual language ● Persuasion through visual images
7	Communication by picture-text integration	<ul style="list-style-type: none"> ● Characteristics of textual elements in virtual environments (typography) for readability ● Construction of the picture-text message ● Transmedia narrative
8	Construction of digital educational resources with visual and textual elements (I)	<ul style="list-style-type: none"> ● Context ● The users ● Aesthetic quality
9	Construction of digital educational resources with visual and textual elements (II)	<ul style="list-style-type: none"> ● Notions of usability. ● Tools for developing educational resources ● Project: an educational website
10	Construction of digital educational resources with visual and textual elements (III)	<ul style="list-style-type: none"> ● Usability evaluation of educational websites

Teaching methodology

This visual literacy educational intervention was developed following a student-centered approach, prioritizing methodologies for active learning. The core methodology was project-based learning (PBL). In this methodology, “the student interacts actively with his co-workers in small teams, and with his teacher, exchanging ideas and discussing progress in the solution or proposed solution to a specific scenario” (Noguez & Neri, 2019, p. 1283). Thus, the students become involved in their learning process and actively participate alone and with their peers in each activity.

The professor conducted each class session in two parts. The first introduces the topic to the students through the resources prepared for this purpose, such as articles, slides, real-time teaching, or web content such as videos. Figure 2 shows students reading from a resource.

Figure 2

Students in the class read from a digital resource on their own devices.



The second part of the class carries out learning activities, such as:

- Role-playing
- Real-time reactions on social networks
- Kahoot games
- Case studies
- Pictionary
- Discussions on the recommended literature list.
- Individual and group expositions about the projects or case studies
- Drawing
- Analysis of photos, posters, and paintings on the university's walls

The active students' participation was permanently promoted, while the professor played the tutor and guide role (see Figures 3 and 4). The professor supported the autonomous learning activities after the face-to-face class in the virtual classroom in Moodle, a learning management system (LMS) by messaging service, and email were used for this purpose. Social networks were not used for communication outside the classroom with students because the learning platform and email proved sufficient. In addition, some tutoring of students took place at the end of each class session when requested.

Figure 3

Students played Pictionary in two groups.



Figure 4
Students drew by hand and explained their drawings to others.



Students' assessment

All students' production elaborated during the learning activities was evaluated with rubrics and checklists from the virtual platform Moodle. The students knew how they would be evaluated since the instruments were presented when requesting the assignments to guide their elaboration. In addition, self-evaluation and co-evaluation were favored using the proposed instruments. Hence, students were involved in their learning process and their classmates. The self-and-peer evaluation provided feedback on the students' learning and facilitated the professor to set partial grades. The sum of the student's grades determined the approval of the course.

General evaluation of the visual literacy intervention

The professor systematically observed a class diary to evaluate the intervention. In this document, the professor wrote several moments of the process that could not be documented in a tangible way (Pérez Pueyo et al., 2017).

On the other hand, the educator analyzed the students' production and the evaluation results. The observations about the crucial aspects of this intervention are presented below:

About the participants

The participants' profile was heterogeneous because of their undergraduate degree, so the diversity in knowledge and experience enriched the discussions. All showed a high motivation for the active learning activities conducted in the second part of the sessions. This strategy helps energize and engage students in class because they attend classes after their full-time work journey. For instance, one student traveled three hours from their hometown to the university to participate in the study.

More than half of the participants were linked to teaching, others were related in some way to the educational field, and a small number were not associated with this field but wanted.

The students chose the topic of their final project. Thus, most of them build a website that could serve them in the immediate future for their professional practice. However, the students who did not work as teachers nor had a job in this field needed help finding an ideal topic. In these cases, the final project was an assignment to pass the course and finish the program.

Infrastructure and equipment evaluation

From a broader perspective, the university infrastructure and equipment were appropriate for this intervention. The students had access to the network from their computers or mobile devices. The professor had a computer with Internet access via cable, from where she could project to the classroom screen.

The virtual learning environment and available resources evaluation

Resources such as scientific articles, videos, websites, multimedia material, and Kahoot learning games were uploaded to the Moodle platform and helped address the different topics. However, during the course planning, the professor confirmed a need for more educational resources to promote visual literacy. There was information on the web, but to support educators, there needed to be a concrete and well-structured resource for online or mobile training.

On the other hand, in the mobile application store, the professor found applications related to visual literacy, such as a visual acuity game for children, a visual attention therapy, and a visual inspection test. However, there were no applications to promote or support visual literacy. Hence, the professor confirmed and promoted the creation of a specific educational resource to integrate into this training process.

After this intervention, the professor designed and developed the *Visual* mobile application (Huilcapi-Collantes et al., 2019) and conducted a pedagogical and user interface usability evaluation (Huilcapi-Collantes et al., 2020a) of this resource. This mobile application is expected to become a helpful resource in further similar interventions and adaptations of this course. "The *Visual* app presents its content in six short units related to the VL course content. [...] Each unit has ten activities [...]. Each activity shows immediate feedback to users by evaluating if the response was correct or incorrect" (Huilcapi-Collantes et al., 2019, p. 642). Thus, the students will understand the topics exposed by doing some activities in the mobile application.

Teaching methodology evaluation

The methodology encouraged students' active participation, which was appropriate for this intervention. Indeed, the professor promoted collaborative learning and self-learning by diversifying the previously described learning activities.

The students perceived these classroom-based activities positively because they could share with their peers some ludic moments that made them de-stress, feel comfortable and enjoy. See Figure 5.

Figure 5

Students made sketches for one of their group projects and dramatizations in teams.



Content evaluation

The course ran in a purely academic environment, and the subject was compulsory. This module took approximately four weeks to complete, and it was the last subject students took before completing the graduate program. The subject articulates with the graduate program curriculum, so the professor integrated the content about visual literacy following the academic coordinator's requirements. The professor added some themes to the course because the coordinator asked her to do that. These themes were: transmedia narrative, usability, and usability evaluation.

The content introduced topics explicitly related to visual literacy in the first three classes. The course needed additional time for students to learn some themes in-depth. They elaborated on the production requested in a short time, and inevitably, some topics were challenging to understand. These were the following:

- Meaning, analysis, and interpretation of visual messages.
- Principles of design for the composition of visual messages.
- Rhetorical strategies to communicate with visual language. (See Figure 6)
- Characteristics of textual elements in virtual environments (typography) for readability.
- Construction of the picture-text message.

Figure 6

Students exposed their group investigations about rhetorical strategies to communicate with visual language.



On the other hand, the university's syllabus format only establishes the course's general objective and specific objectives, and the competencies and learning outcomes are not specified. Kennedy (2007) mentions that the objectives are explicit statements about what is to be taught, but they need to be more precise about what the student is expected to learn and how he will demonstrate it. Thus, a learning process to develop visual literacy should support students in achieving specific learning outcomes related to visual

literacy competence.

After this intervention, the authors proposed a new course structure based on the ACRL Visual Literacy Competency Standards for Higher Education (2011), which describes visual literacy performance indicators and learning outcomes. The ACRL standards are the most exhaustive guide and "tangible set of visual literacy abilities" (Brumberger, 2019, p. 12) to design an intervention, and it is the pioneer in providing a comprehensive framework for teaching visual literacy and its subsequent assessment (Hattwig et al., 2013). This restructuring does not change the themes but reorganizes them following a new structure to align each topic with the intended learning outcomes. The article: "The effect of a blended learning course of visual literacy for in-service teachers" (Huilcapi-Collantes et al., 2020b, p. 1) compiles the new course structure where authors set learning competencies for each standard.

Evaluation of the production requested from students.

The evaluation carried out in the course was linked to the students' production. The evaluation instruments guided students and set the requirements they had to fulfill. However, this evaluation did not reveal the level of visual literacy achieved after the course. The production made by the students was only evidence of performance. Evaluating the degree of visual literacy at a theoretical level was necessary.

Therefore, in the context of the expected doctoral research, the authors proposed two evaluation instruments to assess the development of visual literacy competence after the new course: a test to evaluate the level of visual literacy (Huilcapi-Collantes et al., 2020b) and a rubric to assess the students' project (Huilcapi-Collantes et al., 2022), both instruments align to visual literacy competencies set in the new structure.

Conclusion

This intervention was conducted in the digital era, using emerging technology and current media and considering visual literacy as a fundamental competence in twenty-first-century Education. Indeed, visual literacy influences people's ability to understand the world, learn and communicate. Therefore, this experience confirmed that visual literacy is a complementary and transversal process to developing digital competence.

The graduate students, who participated in the course, needed to develop their visual literacy level because it complements their digital competence development. Some were teachers, and others worked building educational resources and instructional material or manage ICT-mediated learning. Thus, this intervention allowed them to develop the abilities "to effectively find, interpret, evaluate, use and create images and visual media" (Association of Research and College Libraries, 2011, para. 2), helpful for their specific area of work. Indeed, although "fluency in visual communication requires relevant training" (Kędra, 2018, p. 71), the participants acquired some skills that allowed them to communicate better through "picture-text integration" (Lamour Sansone, 2015, p. 4) within the challenging and highly visual educational digital environments.

Analogical in-class activities linked with the student-centered approach helped to activate the knowledge and connect with the themes and sub-themes, helping the students to understand some new concepts and present their projects. By performing these activities, the professor sought the student's active learning to use and apply the knowledge to construct digital educational resources. To illustrate, Pictionary was the first game they played in the opening class, whose theme was: "The literacy concept in the 21st century." The students performed this activity to connect with the concept of literacy and understand that people read linguistic and non-linguistic signs permanently. Pictionary revealed that the images have a meaning for the people who drew them but also for people who read them. Here is the crucial fact of choosing images for educational resources. Some of the draws the students had to sketch were a driver reading the traffic signs, a tourist reading a map, or a man reading a newspaper.

In addition, drawing each other helped students to realize and remember that visual language is the first language they use as toddlers, and each doodle represents what we look at and has a meaning. This activity associated the sub-themes: "Visual images perception," "Meaning, analysis, and

interpretation of visual messages,” and “ The cognitive impact of the visual message.” Throughout this exercise, the professor exposed Díaz Jiménez’s investigation (1993) that adults can not represent themselves because they have not mastered the visual language and have not learned to perceive reality as their eyes see it. Therefore, someone who has not learned visual language cannot produce visual products, read them, or understand their meaning.

Last, the final theme: “Construction of digital educational resources with visual and textual elements,” was challenging for the students. Professor asked students to sketch by hand what was the final group project for this theme, an educational website. This exercise helped them face a blank sheet and put their ideas on it by outlining the site’s pages. The sketch was the idea organizer and memory aid to construct this digital educational resource planned in groups. Also, it helped to organize the visual and textual elements by applying concepts learned in class.

The authors conclude by describing these few activities to emphasize that visual literacy training for professionals in Education or other fields can also incorporate many analogical activities. In this context, it is essential to highlight that although visual literacy has been strongly linked to the techno-cultural phenomenon (Ausburn & Ausburn, 1978), a person may be visually literate without solely using digital resources and electronic devices for his training or having high-skilled digital competence. Indeed, taking into account one of the earliest definitions —considered by researchers such as Pettersson (2020) to be future-proof—. “visual literacy is the learned ability to interpret visual messages accurately and to create such messages” (Heinich et al., 1982, p. 62). Therefore, a person could demonstrate a visual literacy level in non-digital modes. Visual literacy complements, enhances, and supports the development of digital competence. However, some visual literacy skills, such as interpreting images, creating visual messages, or evaluating images and visual messages, could also be acquired without digital technology dependence. Here the professors’ creativity to innovate visual literacy training and adapt the content, such as the one presented in this manuscript, for professionals with any level of digital competence.

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