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Art Didactics and Augmented Application in the Post Digital Era

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Abstract

Art didactics play a crucial role in schools by providing a structured framework for teaching and learning about art. Art didactics refer to the methods, strategies, and principles used to teach art in educational settings. This includes not only the technical aspects of creating art but also the broader concepts related to artistic expression, creativity, cultural understanding, and critical thinking. Digital technologies, especially in the post covid and postdigital era, have influenced both the education system in general and the artistic direction. Traditional art methods and materials will always have their place in the curriculum and in art classes. The research question of the paper is how new technologies and applications are reinventing and reshaping art education in the postdigital era. The use and the study of specific artworks is carried out in a way for the multisensory experience of contemporary cultural reality. We present the field application that was applied in the 4th Primary School in the year 2022-2023. The key was to find a true balance with the field art practice and the high-end tech integration. With the field application we noticed that the students were encouraged in critical thinking and problem-solving skills. Students were able to analyze information, make connections between ideas, and approach challenges with a logical and creative mindset. Communication skills was a key outcome. But in the postdigital era, art education continues to bridge the gap between the human experience and the digital world. It empowers individuals to harness technology creatively, engage with complex ideas, and contribute to a society that values both innovation and the richness of human expression. How can we address old school artworks and artistic content in a multimodal way? Can we address a class free lesson in school? With this field application we want to explore how multimodal communication and interaction can be enhanced and extended through the integration of augmented reality technologies, particularly in the fields of education and digital storytelling.

Keywords: augmented reality, education, application, arts, didactics



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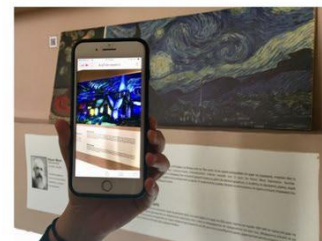
1. Introduction

Initially social semiotics as a literacy of the images (Kress, 1996) offers a conceptual and methodological framework for the reception of works as signs. Despite the aesthetic particularities, which characterize a historical work of art in the context of the visual narrative, the visual testimonies are narrated and construct post-historical derivatives for the receivers. Implementing semiotics into school art programs can be a valuable way to help students develop a deeper understanding of how meaning is constructed in artworks. Semiotics is the study of signs and symbols and how they convey meaning, and it can offer students a framework for analyzing and interpreting various elements within artworks. By incorporating semiotics into art education, students can develop a deeper understanding of how artists communicate ideas, emotions, and messages through visual language. This approach encourages critical thinking, cultural awareness, and creative expression.

Picture 1: Digital Content and Field Practice of the AR Application (Source: Orfanidis Dorotheos)



"Artworks in Motion"





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2. Methodology

The methodology refers to the approach and techniques used to study and analyze multiple modes of communication or information, such as text, images, audio, video, and gestures. Developing a methodology for a field application in a primary school program involves careful planning, organization, and execution to ensure that students have a meaningful and engaging learning experience. Here's a step-by-step guide to help you create an effective methodology:

1. **Identify Learning Objectives:** Clearly define the educational goals you want to achieve through the field application. What specific skills, knowledge, or attitudes do you want students to gain from this experience?
2. **Select a Relevant Topic:** Choose a topic that aligns with the curriculum and offers practical learning opportunities outside the classroom. The topic should be age-appropriate, engaging, and relevant to the students' lives.
3. **Plan the Experience:** Design a structured plan for the field application, including the location, activities, schedule, and resources needed.
4. **Preparation and Orientation:** Provide students with background information about the topic, and the goals of the experience. Discuss safety guidelines, behavior expectations, and the learning outcomes they can expect.
5. **Engaging Activities:** Developing the AR activity that actively involve students in hands-on learning experiences related to the chosen topic.
6. **Guided Exploration:** Allow students to explore and discover concepts on their own, encouraging critical thinking and curiosity. Provide guiding questions or tasks that help them focus their observations and reflections.
7. **Collaborative Learning:** Promote teamwork and collaboration among students. Group activities, discussions, and problem-solving tasks can encourage students to share ideas and learn from each other.
8. **Documentation and Reflection:** Have students document their experiences through journals, sketches, photos, or recordings.
9. **Assessment:** Evaluate student learning through various methods, such as quizzes, presentations, written assignments, or project assessments. Assess not only the knowledge acquired but also their ability to apply concepts and critical thinking skills.



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11. **Feedback and Improvement:** Gather feedback from students, teachers, and any other stakeholders involved in the field application. Use this feedback to refine and improve the methodology for future implementations.
12. **Incorporate Diversity and Inclusion:** Ensure that the field application is accessible and inclusive for all students, taking into account different learning styles, abilities, and cultural backgrounds.

Remember that the success of the field application methodology depends on effective planning, enthusiastic execution, and a commitment to providing meaningful learning experiences for primary school students.

3. Identity and Description of Educational Activity

The purpose of the educational activity was to engage the students of the 4th Public School in Sykies (Thessaloniki) with the theory and history of art as well as the original artistic creation. The field application took place during the 2022-2023 school year. It is 12/class school in capacity, with 189 students and 29 people in the teaching staff. It is an outgoing, inclusive school that participates in actions for ecology, culture and the arts. It has several participations in mobilities abroad (Comenius and Erasmus +).

The field application is based on participatory teaching methods, exploratory learning and working in groups by the students. The teacher does not present and narrate in the class topics but turns into an animator, coordinator and facilitator by providing extra help in the exploratory learning process of the students. There was a focus on the creation of the application for augmented reality (Augmented Reality, AR) and its exemplary application in the school and in the lesson was requested. Teaching is also based on the use of digital, written and visual sources. As for the pedagogical background, it takes into account the need for students to move in the path to find - process - create new knowledge, developing relevant skills and strengthening their abilities, in accordance with theories such as that of "Learning by Design" (Learning by Design) (Kalantzis & Cope, 2004). The students explore sources, reshape them based on specific requests and contribute to teaching by producing their own material.



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Picture 2: The 4^o Primary Schhol in Sykies, Thessaloniki (Source: Orfanidis Dorotheos)



4. New Technologies for Dissemination and Evaluation

In recent years, the definition of digital literacy has gone through a stage of continuous study and redefinition. The term refers to people that cease, not to be passive receivers of information, but having an active role to discover, to evaluate and to utilize the received information in the new networked digital environment (networked digital environment) (Gilster, 1997). In the same logic, an attempt is made to provide a common scientific framework of digital literacy, referring to the fact that it is not a simple skill, but the possibility of functional use of the new digital media, with the aim of the survival of citizens in the modern economy of knowledge and information (Eshet-Alkalai, 2004).

The correct use of their applications and the internet can bring many positives to every student and every person of the new digital age. What is observed is the different way of using digital media and the internet by students, teachers and other agencies as well as reference groups. But at this point we must highlight a fact that was reinforced during the pandemic. Social inequalities, which due to an economic component, resulted in us also getting to know the term digital divide¹ (Selwyn & Facer, 2007).

An important milestone for our project was a custom-made educational tool. We created an augmented reality application, in which the students had the chance to use multimodal material for the artworks in public space. They had access in audio-visual content related to the thematic that refers to the research questions above. Furthermore, it is necessary to use together, as one, visual, auditory, reading/ writing and kinaesthetic elements to embed students in interactive learning environments where they feel connected with each other and the educational content (Deterding, Dixon, Khaled,



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Nacke, 2011).

Picture 3 (←): Augmented Reality (AR) application test run (Source: Orfanidis Dorotheos)

*Picture 4 (→): Students' worksheets, on the subject of Pablo Picasso's visual work, Guernica
(Source:
Orfanidis Dorotheos)*



5. Digital Literacy and Augmented Reality

Augmented reality (AR) is an interactive experience that combines the real world and computer-generated content. The content can span multiple sensory modalities, including visual, auditory, haptic, somatosensory². Integrating digital literacy and augmented reality (AR) into primary school education can offer numerous benefits for students. Digital literacy refers to the ability to use, understand, and critically evaluate digital tools and information, while augmented reality involves overlaying digital content onto the real world, enhancing the learning experience. When implementing digital literacy and augmented reality in primary education, it's important to consider factors like age-appropriateness, accessibility, and teacher training. Teachers should receive proper training to effectively integrate these technologies into the curriculum and guide students' learning experiences.

Augmented Reality can engage learning experiences, visualize abstract concepts and foster creativity and storytelling, as educational tools. allows students to create their own interactive stories and presentations. They can incorporate digital elements like animations, sound effects, and videos, enhancing their creative expression.

Lastly, it's important to keep in mind that technology should be a tool to enhance



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learning, not replace traditional teaching methods entirely. A balanced approach that combines the best of both worlds can create a rich and effective learning environment for primary school students.

6. The Problematic for AR Application

The integration of Augmented Reality (AR) applications in primary school programs presents both opportunities and challenges. Here's an overview of the problematic aspects associated with the use of AR in primary education:

1. Technical Challenges:

- **Hardware Requirements:** AR applications often require specific hardware, such as smartphones or tablets with cameras, which might not be readily available to all students. This could lead to unequal access to the technology and potentially create a digital divide.
- **Network Connectivity:** Many AR applications rely on a stable internet connection to function properly, which might not be guaranteed in all school settings or homes. Inconsistent connectivity could disrupt the learning experience.
- **Technical Support:** Teachers and students may need training and technical support to effectively use AR applications. Schools might struggle to provide ongoing assistance for the integration of AR into the curriculum.

2. Curriculum Integration:

- **Learning Objectives:** Integrating AR into primary education requires careful consideration of how the technology aligns with learning objectives. AR should enhance learning outcomes rather than distract from them.
- **Curriculum Alignment:** Designing AR experiences that align with the curriculum can be challenging. Teachers need to ensure that AR content complements the existing syllabus and teaching methods.

3. Pedagogical Concerns:

- **Distraction and Engagement:** While AR can enhance engagement, it can also be a source of distraction. Balancing the interactive nature of AR with the need for focused learning is essential.

² At Cipresso, Pietro, Giglioli, Irene, Alice Chicchi, Raya, iz, Riva, Giuseppe (2011). "The Past, Present, and Future of Virtual and Augmented Reality Research: A Network and Cluster Analysis of the Literature". *Frontiers in Psychology*. 9: 2086. doi:10.3389/fpsyg.2018.02086



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- **Effective Implementation:** Teachers must be trained to effectively incorporate AR applications into their teaching methods. Inexperienced use might lead to ineffective or even counterproductive outcomes.

4. Privacy and Safety:

- **Data Privacy:** AR applications might collect data on students' interactions and behaviors. Ensuring that student data is handled securely and in compliance with privacy regulations is crucial.
- **Online Safety:** With AR involving online interactions, there's a need to educate students about responsible online behavior and potential risks associated with using AR technology.

5. Accessibility and Inclusion:

- **Diverse Learning Needs:** AR applications should be designed with consideration for students with diverse learning needs, ensuring that the technology is accessible and beneficial for all students.
- **Physical Limitations:** Some students might have physical limitations that prevent them from fully participating in AR activities. Developers and educators need to consider inclusivity in design.

6. Content Quality:

- **Educational Value:** Not all AR content is equally valuable for learning. Ensuring that the content provided through AR applications is educational and aligned with learning goals is important.
- **Accuracy and Appropriateness:** AR content should be accurate, up-to-date, and appropriate for the age and developmental level of primary school students.

In conclusion, while Augmented Reality has the potential to transform primary education by making learning more engaging and interactive, there are various challenges that need to be addressed for its successful integration. These challenges include technical barriers, curriculum alignment, pedagogical concerns, privacy considerations, accessibility, and content quality. To effectively leverage AR in primary education, a thoughtful and holistic approach that takes into account these challenges is essential.



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7. Results

In our primary school educational programs are designed to provide a well-rounded and foundational education for young students typically ranging from ages 5 to 12. The results of a successful primary school educational program can be observed in various aspects of a student's development. Here are some key outcomes that a well-designed primary school program aims to achieve academic skills, where students should acquire fundamental skills in subjects such as language arts (reading, writing, and speaking), mathematics, science, and social studies. Critical thinking. A strong primary education encourages critical thinking and problem-solving skills. Students should be able to analyze information, make connections between ideas, and approach challenges with a logical and creative mindset. Communication, where effective communication is a key outcome of primary education. Students should develop their verbal and written communication skills, enabling them to express themselves clearly and confidently. In primary school is a crucial time for the development of social skills. Students should learn how to interact with peers, resolve conflicts, collaborate on projects, and practice empathy and respect. A well-rounded primary education encourages creativity and imagination. Students should have opportunities for artistic expression, imaginative play, and exploration of various subjects beyond the core curriculum. With the field application we include lessons about diverse cultures, traditions, and histories. This helps students develop an understanding and appreciation for the world's diversity. In the modern world, basic technology literacy is essential. Primary school programs should introduce students to age-appropriate digital tools and resources to prepare them for the digital landscape. We foster a love for learning. Students should be curious, motivated, and eager to explore new topics and ideas. We developed their emotional intelligence and self-awareness. They should learn to manage their emotions, build resilience, and develop a positive self-image.

It's important to note that the results of a primary school educational program can vary based on the quality of teaching, resources available, and the individual needs of students. A successful program focuses not only on academic achievements but also on the holistic development of each student.

Discussion

In the postdigital era, which is characterized by the integration of digital technology into all aspects of life to the point where the distinction between the digital and the physical is blurred, the role of art education remains crucial and takes on new dimensions (Steinkuehler, Duncan, 2008). Here are some key points regarding the role of art education in this era:



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1. **Creativity and Critical Thinking:** Art education fosters creativity, which remains a uniquely human trait. In a postdigital world where automation and algorithms can handle many routine tasks, creative thinking becomes even more valuable. Art education encourages students to think critically, problem-solve, and approach challenges with innovative perspectives.
2. **Digital Literacy:** While the digital realm is pervasive, not everyone is digitally literate. Art education can equip individuals with the skills needed to navigate digital tools and platforms effectively. This includes understanding digital art mediums, utilizing software for artistic creation, and comprehending the implications of digital media on society.
3. **Multimedia and Interdisciplinary Learning:** In the postdigital era, the boundaries between different artistic disciplines are increasingly fluid. Art education can encourage students to explore multimedia approaches, combining traditional and digital techniques. This interdisciplinary approach mirrors the way art often interacts with other fields like technology, science, and social issues.
4. **Visual Communication:** In a world bombarded with information, visual communication skills are essential. Art education helps individuals convey complex ideas and emotions through visual means, whether in traditional art forms or through digital mediums like graphic design, animation, and multimedia presentations.
5. **Cultural and Ethical Understanding:** Art has always been a reflection of society and culture. In a postdigital world with global connectivity, art education can foster cross- cultural understanding and empathy. It can also encourage discussions about ethical considerations related to technology, such as privacy, surveillance, and the impact of AI on society.
6. **Adaptability and Resilience:** The rapid pace of technological change in the postdigital era requires individuals to be adaptable and resilient. Art education often involves experimenting with new techniques and materials, which can cultivate a mindset of
7. exploration and comfort with uncertainty.
8. **Humanizing Technology:** As technology becomes more integrated into daily life, there is a risk of dehumanization. Art has the power to humanize technology by infusing it with emotion, meaning, and a sense of the human experience. Art education can contribute to a more balanced and holistic view of technology's role in society.



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9. **Cultural Preservation and Innovation:** Art education plays a role in preserving traditional artistic practices and cultural heritage. At the same time, it encourages innovative approaches that blend tradition with contemporary methods, helping cultures evolve while staying connected to their roots.
10. **Aesthetic Sensibility:** In a world where aesthetics are often shaped by digital interfaces, art education helps individuals develop a discerning aesthetic sensibility. This extends to recognizing the beauty and significance in both digital and physical forms of art.

In the postdigital era, art education continues to bridge the gap between the human experience and the digital world. It empowers individuals to harness technology creatively, engage with complex ideas, and contribute to a society that values both innovation and the richness of human expression (Prensky, 2001).

The future of new technologies and education is expected to bring about significant changes and advancements in the way we learn and acquire knowledge. We can underline a few key trends and possibilities (Gee, 2003).

Online and Remote Learning in the COVID-19 pandemic accelerated the adoption of online learning platforms and remote education. This trend is likely to continue, offering students the flexibility to learn at their own pace and access educational resources from anywhere in the world. Personalized Learning is a reality. With the help of artificial intelligence (AI) and machine learning (ML), education can be tailored to individual students' needs, abilities, and learning styles. Intelligent tutoring systems and adaptive learning platforms can provide personalized feedback, recommendations, and adaptive content to enhance the learning experience. Virtual and Augmented Reality environments. Virtual reality (VR) and augmented reality (AR) technologies have the potential to revolutionize education by creating immersive learning experiences. Students can explore historical sites, conduct virtual science experiments, or practice real-world skills in a simulated environment (Jenkins, 2006).

The integration of augmented reality in art education holds immense potential to transform the way students engage with art, making it more accessible, interactive, and enriching. While there are challenges to overcome, the benefits of AR in art education cannot be overlooked. As technology continues to evolve, educators must embrace these innovations to provide students with the best possible learning experiences. By addressing the challenges and continuously exploring innovative applications, AR can bridge the gap between tradition and innovation in art education, empowering the artists and art appreciators of tomorrow (Deterding, Dixon, Khaled, Nacke, 2011).

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