



## Regular Article

# Beyond the snapshot: Fostering cultural literacy in the classroom with photovoice

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## ARTICLE INFO

## Keywords:

Photovoice  
Cultural literacy  
Cyanotype  
Education

## ABSTRACT

This article presents the outcomes of a photovoice workshop implemented in an academically gifted program in Pennsylvania, United States. The study's primary objective was to investigate the efficacy of photovoice, using cyanotype-style photographs, when used as an educational strategy for enhancing the cultural literacy experiences of gifted middle school students through creativity and discussion. The project, which involved 36 sixth-grade students aged 11–12, was led by an associate professor from the University of Delaware's Department of Art and Design in conjunction with the school's gifted education teachers. The thematic analysis of student work, using Hall's (1976) Cultural Iceberg Theory, demonstrated the effectiveness of the photovoice workshop in fostering cultural literacy. The workshop ultimately fostered the students' understanding of various aspects and dimensions of cultural competence.

## 1. Introduction

The authors' experience leading photovoice workshops with minority populations in Slovakia, Kenya, and the United States sparked their interest in its potential as an active learning tool for middle school students. While researchers have utilized photovoice to explore issues affecting vulnerable and minority populations (Hergenrather et al., 2009), as a preservice teacher training tool (Bazemore-Bertrand, 2021; Fovet, 2017; Hoffman, 2024), as a method for writing instruction with urban youth (Zenkov & Harmon, 2009), and as a teaching tool at universities (Andina-Díaz et al., 2024; Bazemore-Bertrand, 2019; Fovet, 2017; Rania et al., 2014; Schell et al., 2009), there is a gap in the research focusing on its use to promote cultural literacy in middle school classrooms.

To address this gap, the current article examines the utility of integrating the photovoice participatory method with the historic cyanotype photographic process, with the specific aim of enhancing gifted middle school students' engagement with cultural literacy through creativity and discussions. This article starts with a review of the literature on photovoice and its application in educational contexts to support interdisciplinary instruction and cultivate cultural literacy. Subsequently, it examines the methodology used for reviewing student work

products and then details the procedures implemented during the workshops and for data analysis. The paper concludes by drawing connections to the existing literature, highlighting the implications of photovoice during instruction for supporting engagement and enhancing learning opportunities in K-12 educational settings.

## 2. Literature review

### 2.1. Photovoice

Wang and Burris (1997) initially developed the photovoice technique to advance women's reproductive health as part of public initiatives in China. Following a traditional photovoice method, participants in their study used photographs in small, face-to-face group discussions to express their health-related issues in detail. The primary objective of the technique is to understand and contribute to a broader knowledge base, which is analogous to Freire's participatory pedagogy within the socio-critical paradigm (Freire, 2005). Freire (1970) posited that language constructs our understanding of reality, underscoring the importance of fostering robust student communication in cultivating a more profound comprehension of reality and empowering students to engage actively and responsibly in their learning processes.

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Freire (1970) further cautioned that when educators present reality as “motionless, static, compartmentalized, and predictable,” students are likely to elaborate on concepts that are disconnected from their lived experiences and have limited relevance to their actual lives (p. 71). The passive approach to educational engagement limits opportunities for critical thinking during learning, discussion, and the establishment of meaningful connections to reality for students. In the context of the present study, the students demonstrated active involvement in the learning process.

Traditionally, in the photovoice process, participants first capture images of their experiences; these images are then used in group discussions to empower individuals to share their perspectives with policymakers in various ways. Ultimately, the aim is to influence policymakers and improve the lives of underrepresented individuals through practical action. According to Tanhan and Strack (2020), photovoice surpasses traditional interviews and action research by facilitating more impactful engagement with marginalized or vulnerable communities.

While photovoice can be used as an effective tool to advocate for the voices and needs of different groups of people, it can also provide support without advocacy. Adeboye et al. (2025) conducted a systematic review and meta-analysis of seven randomized controlled trials to examine the quantitative impact of photovoice on mental health and stigma. According to the findings, interventions with photovoice significantly reduced depression and several other mental health issues.

Academic research supports the application of photovoice in the current study, as there are several instances of its use in educational settings. Wang and Burris (1997) advocated for extending the technique beyond its original health research-focused applications into possibly other areas. When applied to research higher education, Hoffman (2024) and Fovet (2017) found similar effectiveness in facilitating university students' critical thinking regarding technology use and helping educational leadership students to connect personally with abstract concepts, such as oppression (see also Andina-Díaz et al., 2024; Caffey & Hunayan, 2023; Parkhouse, 2016; Thurber et al., 2019). Therefore, utilizing photovoice as a tool to support middle school students in their cultural literacy discussions is a suitable application of the technique.

## 2.2. Photovoice in education

Researchers have used photovoice approaches in higher education situations to better personalize abstract or unfamiliar factual subject matter in college classrooms (Andina-Díaz et al., 2024; Bazemore-Bertrand, 2019; Fovet, 2017), to provide background to aid in-service teachers (Caffey & Hunayan, 2023), to study at-risk youth's decision-making related to educational issues (Warne et al., 2012), and to participate in action research to document the lived experiences of displaced and marginalized people (Andina-Díaz et al., 2024; Bale & Cox, 2023).

Other studies have begun to examine photovoice at the periphery, given its recent advancements in K-12 settings within after-school programs. However, these primarily focus on isolated topics, such as gender bias in middle school (Bell, 1996) or social advocacy in after-school programs (Wilson et al., 2007). Furthermore, if pre-service teachers learn photovoice strategies in college, they will apply those strategies and technologies to their students' learning (Hoffman, 2024).

Using a mixed-methods research design, Andina-Díaz et al. (2024) found that nursing students during the COVID-19 pandemic perceived photovoice as a valuable tool for connecting with real-world social issues, enhancing their motivation, and encouraging them to actively address health inequities. Bazemore-Bertrand (2021) also reported in an

action research study related to curriculum design that preservice teachers' perceptions showed bias towards students and parents living in poverty. Even though the author (serving as both teacher and researcher) evaluated their own experience, photovoice proved to be a practical approach, causing a significant shift in how pre-service teachers viewed stereotypes.

Another study, using photovoice in a university context, focused on supporting educational leadership students' emotional investment in abstract social justice concepts (Fovet, 2017). The photovoice process guided graduate students beyond a purely conceptual understanding of oppression to establish a “personal, lived, almost visceral connection” that provided them with the necessary context for their future research (p.6). The studies discussed provide evidence of using photovoice as a tool to raise awareness about social issues among university students; however, the direct transferability of the method to a middle school experience is limited. For example, based on Fovet's (2017) observation of participants' (self-motivated graduate students') hesitations, this serves as a warning that young children may find this kind of more personal work too emotional, having only experienced their parents' values. So, while Andina-Díaz et al. (2024) and Fovet (2017) claim that photovoice has the potential to create a deepening process of thinking and engagement, there still exists uncertainty about the level of modifications necessary to utilize it in K-12 settings. The research with graduate students demonstrates how photovoice has the potential to create a “visceral connection” to abstract concepts, and future research would benefit from exploring its impact across a variety of settings and populations.

In a 2014 article, Adams et al. presented evidence to illustrate how photovoice can improve literacy skills and empower under-resourced English language learners (ELLs) in K–12 classrooms. The authors explored photovoice as not simply a supplementary activity, but as a highly effective and high-yield practice to support students in developing their academic language, engaging in writing as reluctant writers, and fostering a sense of community in the classroom. The authors posit that prompting students to use personal photos as a starting point for writing, for example, is an engaging and effective strategy to engage students, support language development, and produce high-quality writing. Despite these compelling examples and evidence for the benefits of photovoice for students, the authors do not include any direct student-generated data or work. Therefore, the authors suggest that future researchers explore the use of photovoice in K-12 settings across a broad range of subjects and with diverse student populations to gain a deeper understanding of photographic inquiry beyond the language-learning context.

Although existing studies using photovoice exemplify a robust model of active learning, using photovoice in K-12 education raises a need for considerable modification, as the feelings of fear and discomfort experienced by the nursing student participants further complicate the ethical and emotional issues regarding the engagement of younger learners with sensitive topics (Caffey & Hunayan, 2023). Therefore, in the present study, the researchers modified the photovoice technique to incorporate the historical cyanotype photographic development process, in addition to the original photovoice process. Teachers can easily facilitate cyanotype projects in K-12 school settings (see Appendix D for the Photovoice Process in the Classroom, allowing students to use simple techniques to create images that emphasize key focal points. A more extensive description of the cyanotype development process is in the Appendix section (Appendix A and Appendix B).

### 2.3. Cultural literacy in education

In their influential publication, Hirsch et al. (1987) introduced the concept of cultural literacy, presenting the notion that a basic level of shared background knowledge is essential for effective communication and participation in a culture. The authors elaborated on cultural literacy as a “network of information that all competent readers possess” (p. 2). This information serves as the prerequisite knowledge that enables understanding, implications, and situational context to represent the meaning conveyed in texts and communication.

While Hirsch’s (1987) early model defines cultural literacy as a limited body of shared background knowledge required for effective communication and social mobility, more recent scholarly work argues against this understanding of cultural literacy as a checklist because of its simplicity (Maine & Vrikki, 2021). Maine and Vrikki (2021) promote their Dialogue and Argumentation for Cultural Literacy Learning in Schools (DIALLS) methodology, which develops cultural literacy through complex conversations rather than simply acquiring shared background knowledge.

Similarly, Lähdesmäki et al. (2022) also support a less rigid conversation-constructed orientation of cultural literacy as a “social practice that is inherently dialogic and based on learning and gaining knowledge through emphatic, tolerant, and inclusive interaction” (p. 1). This definition frames cultural literacy as a social practice built on dialogue, emphasizing creativity, empathy, tolerance, and inclusion. This more comprehensive theoretical understanding posits that creativity serves as a mediator for acquiring new cultural knowledge, encompassing both hard skills and soft skills, as well as a subconscious sense of culture and emotional intelligence. (Haryati et al., 2023). Photovoice methods rely on conversation; therefore, to meet the focus of dialogical inquiry, the definition of cultural literacy will be akin to that of Haryati (2023) and Maine and Vrikki (2021).

The process of photographic production in this study supports conversations about cultural literacy that utilize image-making and other visual forms of artistic representation as sites of expression for complex ideas (Clark, 2011; Deguara, 2015). Photographs—as an educational tool—are especially favorable for promoting a sense of rigor and differentiation when teaching about abstract topics, such as culture, and its various dimensions, including material, non-material, products, practices, and perspectives. This approach was incorporated into the research in light of its significant potential to promote cultural literacy and essential life skills.

Cultural literacy refers to a practice that is both situated socially and culturally; it is not a separate practice, but a practice that is fundamental to literacy learning. Teachers can incorporate cultural literacy into their lessons so as to develop it in educational settings at all levels. For instance, classroom practices can engage and foster cultural literacy across different content areas of the curriculum without ever teaching cultural literacy as a separate subject. Practices like this have proven effective in addressing prejudice and inequality, while also fostering diversity, social engagement, and community involvement.

Lee and Ward (2024) recommend reconceptualising literacy teaching as emotional and relational. Using affective neuroscience as the foundation for their argument, they show that whatever there was (or was not) emotional salience in students’ learning, would be filtered through their engagement in cultural practices; again forming a combination of separate cultural practices into active engagement and comprehension. Although this critique was actually targeting an educational approach that focused on a single dominant cultural repertoire or canonical text for all students, the authors briefly mention pedagogical practices for valuing and even preferring diverse practices

of cultural literacy in the classroom. Regardless, the work is an essential text that frames the pedagogy of cultural literacy practices with a central cognitive process of learning, as described above, and scaffolds the notion of valuing culturally relevant practice that capitalizes on students’ diverse cultural schemas and repertoires (ABC Life Literacy Canada, 2024; Lee & Ward, 2024).

Siliņa-Jasjukeviča and Rancāne (2022) investigated a pedagogical approach for teaching cultural literacy. They presented a conceptual exploration of teaching traditional culture through the ritual framework—a specific practice with deep symbolic significance that embodies disparate ideas, such as old customs versus new developments, by attending to the ritual content, such as when, where, who, what, and why, participants could start to form a complete sense of their culture. The authors argue that if traditions are severed, then education will need to take a whole (and thus holistic) approach when teaching culture, conceptualizing it through the foundational elements of the content curricula framework. While this framework offers a valuable model for articulating the integration of different cultural content in Latvian schools, it raises future research opportunities to examine the practical efficacy of ritual-based pedagogy in more diverse, multicultural classrooms (Siliņa-Jasjukeviča et al., 2023).

As cultural awareness grows, individuals are more equipped to engage in intercultural interactions, thus decreasing misunderstandings and barriers to communication (El Amir, 2024). El Amir (2024) likened culture to water, suggesting individuals are often unaware of their cultural norms until faced with different cultures. The students’ photovoice projects were intended to serve as the first impartial engagement with cultural differences and conversations in this study. Cultural literacy activities – nourished by consciously immersing in and interacting with cultural phenomena (both material and immaterial) – are a precursor to cultural competence (Hirsch, 1988). People use cultural competence to understand the traditions, practices, and histories of cultures. The teachers introduced the photovoice workshop by explaining its goal of fostering cultural literacy and how students would apply Hall’s cultural iceberg model to analyze cultural competencies.

### 2.4. Edward Hall’s Cultural Iceberg Model

Hall’s (1976a, 1976b) cultural iceberg model (Appendix C) has been a valuable resource for learners for many decades, serving as the primary visual conceptual framework for understanding both the conscious, observable artifacts of culture and its subconscious, embedded elements. Educators and authors value the model as it can help introduce learners to the complexity of culture at multiple levels. While contemporary researchers view the cultural iceberg model as oversimplifying culture in its representation, it remains one of the most relatable frameworks in education (Midgette, 2023).

The framework illustrates that only a small portion of cultural differences are readily visible, while the remainder lies beneath the surface (El Amir, 2024). While specific cultural elements, such as behavior and artifacts, are observable, social knowledge (for example, religion, economic systems, family structures, or fundamental values) lies beneath the surface in varying degrees and, often, subconsciously. The subconscious level is tremendously complex and requires an authentic experience in a society to achieve some understanding of any one culture. As a means to enhance opportunities for learning about culture, visual methods—such as photovoice—aim to assist students in understanding that all organizations have cultures that drive beliefs, behaviors, internal structures, and ultimately, the ability to flourish across contexts (Wang, 2024; Wang & Burris, 1997).

In this study, the researchers employed photovoice as a creative

visual literacy learning strategy to enrich gifted learners' understanding of cultural literacy and foster a deeper connection to the abstract concept of culture. The research used photovoice to expand cultural literacy by providing students with a means to explore genres of culture using visual images and storytelling conversations.

### 3. Methodology

As for the research objective, this study examined the efficacy of photovoice as an educational strategy to support the learning experiences of gifted middle school students in developing cultural literacy.

The study used a qualitative Participatory Action Research (PAR) approach to achieve the research objective. The purpose of PAR in an educational research study is to combine research and action. This study employed photovoice, a participatory, qualitative visual method, to evaluate the efficacy of photovoice as an educational strategy for enhancing cultural literacy learning. Using a PAR strategy with photovoice allowed students to express their opinions (Suprpto et al., 2020). Suprpto et al. (2020) discussed that photovoice is a strategy that directly aligns with the PAR principles; creating shared dialogue the core of this method. Furthermore, the majority of photovoice projects are conducted within the PAR framework (Wang & Burris, 1997).

Freire's concepts of action, reflection, and empowerment shape both photovoice methods and PAR as they are used to give study participants a voice. The photovoice techniques, combined with the PAR strategy, align with the study's goal to investigate the depth of students' cultural literacy related to thinking (Cogan & Miller, 2014). The reflective cyclical aspect of the PAR process is necessary for determining deep thinking. It asks students to think beyond surface-level thinking and representatively analyze their experiences to make meaning ultimately. Rather than merely asking, "What did you do?", PAR instead asks, "Why did it happen that way?" "What does this mean for us?" (Suprpto et al., 2020, p. 7). The photovoice method, with PAR, indicates that participants analyzed "the level of one's critical thinking of images," which shows their capacity for deep thinking about what they see directly (Suprpto et al., 2020).

### 4. Participants and school context

In this study, we utilized a non-probability convenience sampling technique to select the 36 student study participants. Studies in education often use convenience sampling because researchers or teachers may utilize students they typically work with (Golzar et al., 2022). A convenience sampling approach was appropriate in this instance since the researchers worked directly with the middle school student study participants, and this is common practice in PAR (Golzar et al., 2022).

The sample population consisted of gifted 6th-grade students (11–12 years of age) who were enrolled in a multi-literacy class. Gifted students were identified for the cohort class based on their high IQ scores and a demonstrated need for enrichment of the standard grade-level curriculum. Although Golzar et al. (2022) warn against limiting the generalizability of studies, it was acceptable to study the utility of the photovoice strategy in this case, as researchers could potentially test it in other populations at a later time.

In an effort to limit class size when running the photovoice workshops and to ensure a degree of individualized attention, the students remained in their enrolled classes of 18 students. Three collaborating teachers oversaw the workshops: two middle school English-certified teachers, each leading one class, and a gifted education-certified

teacher who instructed both classes on alternate cycle days. The school adhered to a six-day rotational schedule. Gifted students attended classes with their regular education teacher four days per cycle and with the gifted support teacher for the remaining two days.

The district is based in an agricultural suburban area. All schools (within the district of six schools, or four elementary schools (K-5), one middle school (grades 6–8), and one high school (grades 9–12) aim to empower students to thrive through community activities and educational awareness to honour diversity within. The district's mission states "to empower each student to succeed in life and contribute to society" (UCF Mission, Vision, Values, 2024). The district's goals aim to honour, appreciate, and celebrate diversity. The middle school has a student body of close to 1000 students. The administrators embraced the mission of the district to demonstrate transparency of policy and inclusion by creating an environment that fosters all students' love of learning through a community and collaboration between teachers and parents (people-centered culture), curricular options of rigor with highly qualified teachers (educational excellence), and honoring each student's individual needs (superior school experience). Ultimately, the district strives to portray its graduates as embodying the values of the surrounding community by promoting continued education, achieving success, contributing to the community, and upholding high ethical standards.

### 5. Project procedures and data generation

**Project Summary:** The photovoice workshop was created as a unique enrichment segment of a broader cultural research experience for 36 gifted students. Prior to the enrichment workshop, students collaborated with the literacy teacher and school librarian to strengthen their research abilities in order to investigate the cultural traits of their selected country. The subsequent enrichment workshop was co-led by the gifted support teacher and a professor from a nearby university. The complete workshop took place over four separate days, in either the school library or the science lab.

**Session 1:** The opening day of the workshop featured a presentation on photography and culture from a University of Delaware associate professor of art and design. The presentation explored photographic and documentary techniques for revealing personal cultural narratives, utilizing photographs from Peru, Africa, and Slovakia to introduce students to the concepts of bias and ethnocentrism. The guest speaker provided brief examples to offer an overview of the technical aspects of photography, including angles, lighting, the rule of thirds, contrast, balance, and the underlying chemistry (Bale & Cox, 2023). The students were given the first data collection tool, the "Student Reflection Questionnaire," so they could ask any questions before beginning their photography assignment. The students responded to the prompt: "What does culture mean to you?" between sessions 1 and 2.

**Session 2:** After a short recap of session 1, the 36 students used a web-based program called Adobe Spark to convert their photographs into digital negatives. The instructional team printed the negatives onto 8" x 10" transparency paper between sessions 2 and 3. This style mimics the historically large-format cameras depicted in session 1.

**Sessions 3 and 4:** For the final two days of the workshop, students were sub-grouped into two smaller groups of 18 participants to create their cyanotype images. The process started with hand-painting a light-sensitive solution (a two-part mix of ferric ammonium citrate (or oxalate) and potassium ferricyanide) to fine art archival paper. Once the emulsion dried, the students carefully placed their digital negatives on

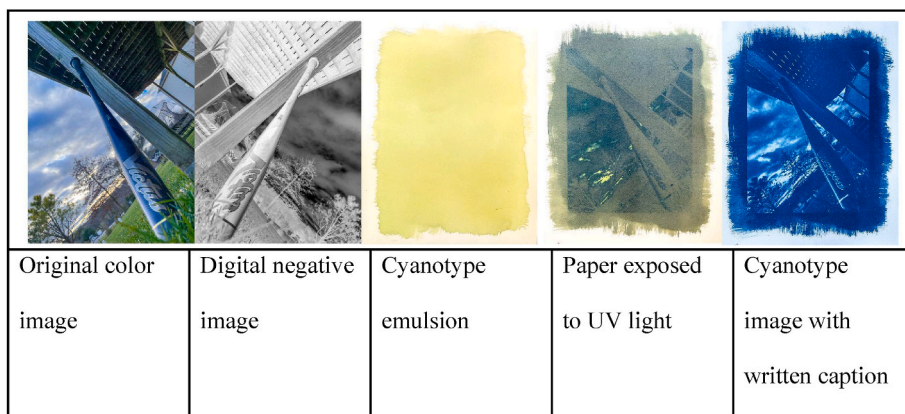


Fig. 1. Cyanotype progression.



Fig. 2. Photovoice workshop images displayed in the classroom.

the sensitized paper, covered the paper with glass, and exposed everything to ultraviolet light for 10 min. As demonstrated in Fig. 1, the cyanotype photo development occurred in phases using a water tray, with the aid of a few drops of hydrogen peroxide that were added to speed the chemical reaction.

The students inserted the images into their digital classroom research project presentations, and the originals were also displayed in the school

(see Fig. 2). As the final step, the students completed another anonymous Google Form survey called “Student Culture Project and Research Project Reflection.” The teachers administered the anonymous survey through Google Forms, attempting to gain insight into the connections students made between the culture research project, conducted while working with the regular education teacher, and the study’s photovoice enrichment activity.

6. Data analysis

Analytical Method: The students’ photovoice responses, captions, and responses to the open-ended question, “What does culture mean to you?” were examined using inductive thematic analysis to identify common themes in the students’ data as they related to Hall’s levels of cultural knowledge. Ahmed et al. (2025) favor this bottom-up approach to data interpretation in educational research since the findings emerge directly from the analysis rather than from matching data to previously defined categories. Although in this case, the researchers did categorize the conclusions according to Hall’s levels, the findings within these levels were analyzed for common themes. Furthermore, there is no existing data for how photovoice has been utilized in middle school students to build cultural literacy, and therefore, no previous categories could be reasonably used (Lester et al., 2020).

Analytical Framework: The students’ data were classified and categorized using Hall (1976a, 1976b) cultural iceberg framework. This simple illustration simplifies culture into three levels of observable and unobservable characteristics of culture (Frank, 2013). Examples of the three phases can be found in Figs. 3-5.

Analytical Procedure: The three authors engaged in a multi-step data

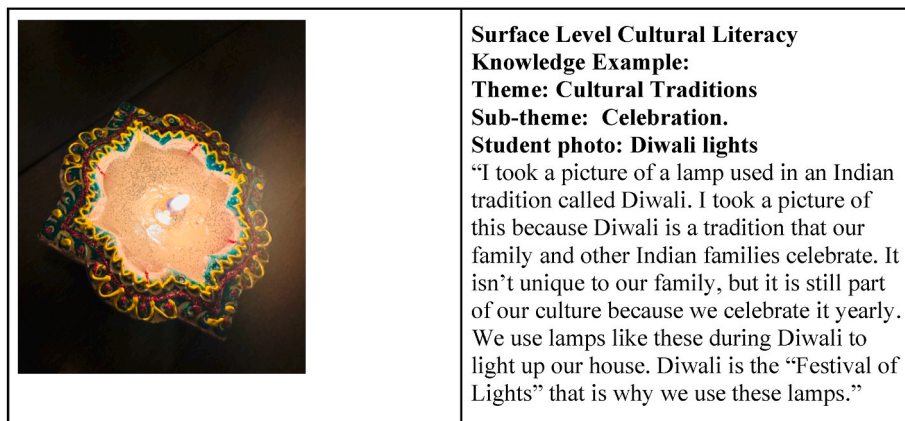


Fig. 3. Surface Level (S): Concrete, visible objects such as food, artifacts, sports, and holidays.

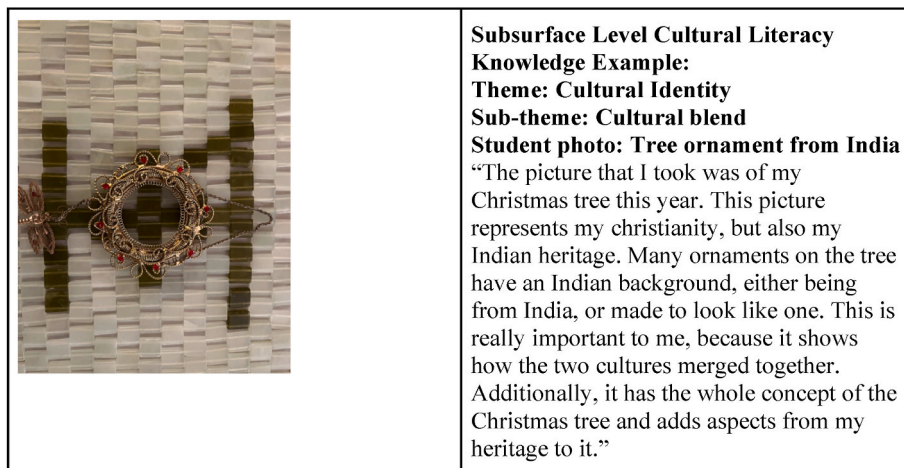


Fig. 4. Sub-Surface Level (SS): Trends such as non-verbal communication, concepts of time, and social trends.

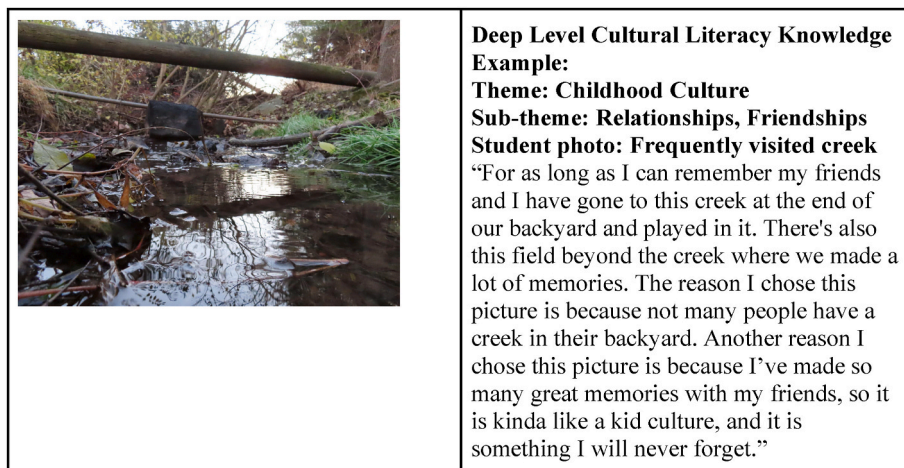


Fig. 5. Deep Level (DL): Cognitive values, deep beliefs, and attitudes.

analysis process (Ahmed et al., 2025).

Phases 1–2: Data Familiarization and Initial Coding. The researchers examined the student data multiple times before developing their own theory of the patterns. The next step in the process was to derive initial codes, and the researchers agreed on the types of data that would be assigned to each code. This approach organized the data in a more reasonable format for categorization.

Phases 3–5: Searching, Reviewing, and Defining Themes: The authors next collaborated on gathering the codes into larger patterns organized according to the depth of students' cultural literacy. To uphold inter-rater reliability, the researchers continued to analyze and compare decisions of how to categorize the codes, discussing each of the discrepancies until they agreed that the codes sufficiently and accurately classified the students' understanding of either SS, SC, or DL.

Finally, the researchers organized the students' work products through Hall's cultural iceberg model (surface, sub-surface, and deep). For example, a response such as, “Culture is about family, your background, friends, and how you live your life,” was first given the code “closeness to family/friends.” Through discussion and refinement, the

researchers grouped this code into the broader theme of “values,” which was ultimately classified as “Deep Level (DL)” within Hall's framework.

## 7. Findings

### 7.1. Cultural literacy knowledge findings

The central aim of this study was to investigate the use of photovoice with cyanotype techniques to enhance the cultural literacy learning experiences of a specific group of gifted learners, as measured by Hall's levels of cultural knowledge. The categorization of the data (see Fig. 6) revealed that most of the students' captions and responses were at the surface level. We categorized the content of the student responses at each level and found that their responses varied, but common themes could be identified based on the frequency of words and ideas. Subsequent sections will illustrate the identification of diverse cultural features in student responses (categorized by surface, subsurface, and deep levels), providing examples of their higher-order thinking in cultural contemplation.

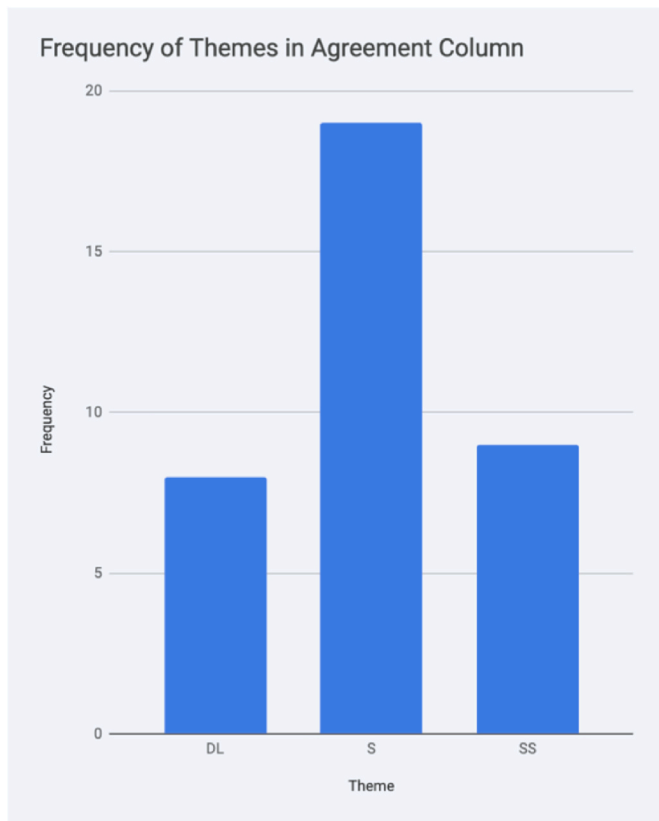


Fig. 6. Frequency of Themes in Agreement Column (S for surface, SS for sub-surface, D for deep level cultural literacy knowledge).

## 8. Discussion

Using Freire's (1970) socio-cultural framework, this research confirms previous findings about photovoice as a tool for helping people learn and think more deeply about abstract concepts such as culture (Andina-Diaz et al., 2024; Bazemore-Bertrand, 2019; Fovet, 2017) and develop background knowledge (Caffey & Hunayan, 2023). The primary goal of this study was to determine whether photovoice would serve as an educational strategy to enhance the cultural literacy learning experiences of gifted middle school students. Evidence from student feedback categorized into Surface, Sub-Surface, and Deep Level categories confirms the positive experiential nature of photovoice. It corroborates that photovoice has a role as an educational strategy within K-12 environments.

In the students' feedback, the students mentioned engagement and new background knowledge. Bazemore-Bertrand (2021) had similar results with nursing students as they gained insight into their own biases toward impoverished students and parents. Photovoice in both studies opened ideas that the participants never considered. This feedback suggests that the photovoice strategy can enhance student engagement and ultimately foster relationship-level learning by providing new background information through diverse perspectives. For instance, the students noticed differing life perspectives, engaged in critical thinking while reflecting on culture in relation to history, economy, religion, and practices. According to the culture project of S 13: "The economy's ups and downs can cause good things or a great depression, playing an important part in a country's history." Meanwhile, other students commented on the initial presentations:

*The most interesting fact for me was that our eyeballs receive light upside down. (S4)*

*The most interesting part of the presentation for me was when the instructor was talking about the early camera obscura, because I had no previous knowledge of this topic, and I didn't even know that it existed. (S9)*

Indeed, there were many ideas with which the students could connect with and learn from.

Andina-Diaz (2024) found that there was motivation and high engagement among nursing students in their study as they actively participated in all phases of the research. The results of the current study corroborate this previous research that visual projects can support students' motivation to extend their learning by linking abstract concepts with real-life experiences. As the nursing students in Andina-Dias' (2024) study had to go into their communities to take photographs, fill out a reflection opening template for each image, and discuss the photos and narratives in groups. From there, their project evolved into a photo gallery and a month-long exhibition at the university. The gifted students in this study showed similar expressions of engagement in their workshop feedback, as well as an interest in showcasing their photo galleries and participating in discussions and reflection opportunities. In contrast to the findings reported by Warne et al. (2013) about at-risk youth's decision-making abilities related to education, educators in the present study neither controlled the students' projects nor constrained the dialogue with the students. Previous research has warned that their parents' values often limit students and that they can feel embarrassed when discussing challenging topics with other adults. In the current study, students led the conversations, and this helped to minimize potential discomfort.

Photovoice techniques can also help students visualize abstract concepts (Andina-Díaz et al., 2024; Fovet, 2017; Sabino, 2020; Zenkov & Harmon, 2009), while improving their writing skills (Adams et al., 2014; Ličko et al., 2024). Cyanotypes further extended the current photovoice workshop with its multi-sensory dimensions, being an appropriate modification to implement in a K-12 learning environment. This simpler form of photography required students to evaluate their photographic composition, highlighting key concepts posed by their cultural consciousness and linking functions across different curricular domains. Students reported:

*I liked learning about the cameras and how they did the same things eyes did. (S3)*

*I will use it to make my photography skills better. I can make the picture for the cyanotype project have more meaning behind it. (S5)*

*I will surely use this to better my photography skills and the pictures I take for the project. (S4)*

Such insights into the students' learning reflect the aspects of the photovoice activity that the students connected with the most; some of them appreciated the scientific aspects behind the techniques, while others resonated with the storytelling aspects of photography.

Additionally, the process challenged students' digital editing skills, as it entailed carefully adjusting the tone and contrast before manually coating the paper with a light-sensitive emulsion to create a unique cyanotype print (Rania et al., 2014). The multi-sensory approach allowed for a perfect blend of digital precision and hands-on creation (Kong, 2021). For instance, the students carefully reflected on how to apply the workshop since they yearned to continue building on the skills they had attained and share their newfound knowledge with family:

*I want to show my family how to take pictures using different techniques. (S8)*

These students enhanced their learning experiences and applied their knowledge to achieve real-world outcomes.

The production of cyanotype images and their captions brought new life into photovoice projects, making the entire process of student engagement in the discussion and reflection on culture and artistic

expression more immersive. At the same time, from a visual perspective, the method provided a secure environment for articulating differing viewpoints (Ryan & Deci, 2009). Caffey and Hunayan (2023) cautioned against potential hurdles, but they were avoided through open discussion of personal experiences. Alternatively, students could focus on the depth of contrast in the images in their discussions and exclude the photographs about sensitive subjects. Some students who were more drawn to the photographic techniques went on to create cyanotypes as part of their cultural literacy learning projects, sharing an appreciation for the power of visual storytelling and learning several techniques to achieve stronger images.

*Learning about how light and the position of the camera can impact the picture so much. With this information I will try different lighting and camera positioning to try and take the best picture possible. (S11).*

The learners incorporated photography into their debates on topics related to illumination, angles, history, and the physics of image capturing and perception. This finding corroborates Zenkov and Harmon's (2009) emphasis that photovoice is a valuable method in academic and real-life contexts and can have positive results in engaging youth with writing. However, they "reject traditional literacy opportunities as questionably relevant interruptions in their lives" (Zenkov & Harmon, 2009, p. 583). In this study, the participants were willing and eager to partake in the activities.

The cultural iceberg by Hall (1976a, 1976b) helped to categorize the depth of the students' cultural literacy. In photovoice workshops, students were encouraged to make personal connections between their responses and the pictures by actively exploring picture details and engaging in group discussions, thereby helping them develop insight into diverse cultures through authentic tasks and visual storytelling, rather than relying on mechanical memorization or brief factual recall (Frank, 2013). This finding supports the newer views of the ongoing development of cultural literacy over dialogue and open interactions rather than simple background building (Lahdesmaki et al., 2022; Maine & Vrikki, 2021; Hirsch et al., 1987), thus paving the way for the transformation of photovoice projects as an educational approach with growth opportunities (Wang & Burris, 1997). Such projects enhance communicative competence, learner engagement, and interdisciplinary skills by encouraging students to delve into the subject matter through the medium of vision and expression.

Moreover, integration of visually based photovoice in school settings could function as a differentiation strategy, allowing gifted students to grapple with varying task complexities instead of simply being handed additional assignments (Moser et al., 2019). This differentiation precipitated genuine engagement (Warne et al., 2013) and became a tool for perspective collaboration (Zenkov & Harmon, 2009). It aided learners in creating artifacts that demonstrated sophisticated cognitive abilities or in conveying an abstract idea through a single image (Ambrose, 2021; Winebrenner, 2012). The findings of the present study align with those of Adams and Brooks (2014), suggesting that when educators exhibit open-mindedness, are collaborative, and well-prepared, photovoice presents learning opportunities that can immensely benefit students' profiles in cultural literacy. This approach, evident in students' deep cultural awareness, enables them to "express themselves in sophisticated and empowering ways" (Adams & Brooks, 2014, p. 8) through the photovoice experience, which involves complex issues when used as a teaching method.

While the role of the teacher in facilitating photovoice learning opportunities warrants further investigation, it is notable that the workshop's success rested upon the co-construction of meaning among students and between students and teachers. Consequently, acknowledging the educator's pivotal role, their qualifications, and the depth of their cultural literacy are fundamental for developing cultural literacy and addressing sensitive societal topics (Callahan, 2017).

## 9. Strengths and limitations

This study's distinct contribution lies in revealing the benefits of employing photovoice techniques to enhance cultural literacy, specifically among gifted students. However, a primary limitation is its confinement to the gifted student population of a single affluent suburban middle school. Consequently, further research is warranted to comprehensively establish the pedagogical advantages associated with photovoice as an educational strategy for enhancing the conceptual understanding across diverse student populations.

While the judicious selection of appropriate interdisciplinary educational content, learning methods, and strategies undoubtedly facilitates the development of learners' cultural literacy, a key challenge lies in determining how teachers can effectively integrate such approaches into existing curricula to enhance learning opportunities for complex topics. Nevertheless, the application of photovoice as an instructional technique within K–12 educational settings holds substantial potential for fostering students' interdisciplinary learning, individuality, creativity, literacy, and other crucial competencies vital for navigating the complexities of the 21st century.

## 10. Implications and future research

Replicating the photovoice format as we have carried out, can be enriching also for pre-service teachers in teacher training departments where they can see the value and benefits of student-centered approaches (as opposed to the teacher-centered approaches) to their students' global skills, thus being an effective tool in the context of professional development of educators (both future and in-service ones).

Furthermore, as indicated in recent studies, photovoice can also be used very promisingly to treat mental health issues, as suggested by Adeboye et al. (2025), Barry and Higgins (2020), and Becker et al. (2014).

For the future, we see it as very promising and inevitable to conduct photovoice workshops online whenever this format could better serve the needs of the participants, especially in the face of disasters (e.g., conflicts, wars, epidemics, pandemics, hurricanes) when it is much more convenient to participate online (Tanhan, Strack, 2020). We encourage future researchers to explore fostering cultural literacy among participants through the online photovoice method when the situation requires it (Tanhan et al., 2023).

Online photovoice is highly effective also in online schooling education, where it can bring similar benefits for the participants as photovoice conducted in brick and mortar settings (Reyes-Foster & DeNoyelles, 2018). Online photovoice (OPV) or virtual photovoice (Ciolan, Manasia, 2024) can be considered as an innovative and practical approach to enhance learners' knowledge, skills, and dispositions toward different global competencies in the 21st century.

## 11. Conclusion

As a dynamic and compelling pedagogical approach, photovoice workshops are shown in this study to be highly efficacious in cultivating cultural literacy through the establishment of interdisciplinary connections. By facilitating hands-on, interdisciplinary learning experiences, these workshops have demonstrably empowered students to explore and critically engage with diverse cultural contexts. Moreover, by stimulating multiple sensory modalities and fostering critical thinking, creative expression, and interdisciplinary competencies, the workshop facilitated profound emotional and intellectual engagement with cultural topics.

The iterative process of photographic creation and peer discussion fostered a more nuanced and active understanding of cultural diversity among students, thereby enhancing their empathy, promoting tolerance, and strengthening their ability to navigate complex global societal challenges. The successful outcomes of this workshop underscore the

considerable potential of photovoice as an efficacious educational strategy for cultivating cultural literacy in middle school students, particularly within an increasingly diverse and intricate global landscape.

Furthermore, this investigation emphasizes the critical importance of cultivating a supportive and collaborative classroom environment, highlighting the pivotal role of the educator in orchestrating meaningful and dialogic learning experiences. While these findings indicate substantial benefits, further research is warranted to fully understand the comprehensive potential of photovoice in enriching the learning experiences of a broader student population, extending beyond gifted cohorts and encompassing a wider range of curricular domains.

#### CRedit authorship contribution statement

**Eva Straub:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **Jon Cox:** Writing – original draft, Methodology, Conceptualization. **Anna Slatinská:** Writing – review & editing, Writing – original draft, Methodology.

#### Data availability

The analyzed data during this study are included in the submitted article. The data that support the findings of this study are available on request from the corresponding authors.

#### Ethical statement

This study was approved by the University of Delaware Institutional

### Appendix A. Photovoice Lesson with Cyanotype Photo Development Technique (abbreviated)

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#### Materials

trays (plastic or glass for developing the cyanotypes)  
 access to water  
 photo specific printer  
 transparency printer paper clear printer paper  
 cyanotype archival/watercolor paper  
 cyanotype solution (hand-painting a light-sensitive solution of two chemicals—ferric ammonium citrate [or oxalate] and potassium ferricyanide, which are widely available in a two-part mix—onto fine art archival paper)  
 brush/sponge for coating the solution onto the cyanotype paper  
 computer for editing digital images  
 Glass to place on top of the digital negative and coated paper  
 Sunlight or an artificial UV light (test first for development duration)

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#### Lesson Day 1: (45 min)

Introduction to culture (guest speaker presentation and photography basics)

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#### Lesson Day 2: (45 min)

Take and edit pictures (create digital negatives) for the prompt: “What does culture mean to you?”  
 7. Modification: students can take pictures for homework

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#### Lesson Day 3: (45 min)

Cyanotype process and captions for printed pictures

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#### Possible Topics for Application:

- Cultural Literacy
  - Science - plant preservation
  - Sensitive topics that require symbolic representation
  - <https://www.gathered.how/arts-crafts/guide-to-cyanotype-printing>
- 

### Appendix B. Cyanotype

To enhance cognitive engagement, this study utilized the historical context of the cyanotype process, drawing on its origins as an early photographic method exemplified by Atkins' (1843) pioneering botanical illustrations. This historical insight captivated students, fostering an appreciation for the evolution of photographic techniques across centuries. Furthermore, the integration of photovoice with cyanotype photo development enhanced engagement, transcending traditional classroom learning and student research. This synergistic approach also introduced rigor to the lesson, effectively challenging the cohort of gifted students. The photovoice workshop successfully met the target school's criteria for effective differentiation through challenge by fostering interdisciplinary engagement among the students. The efficacy of this approach was substantiated by student feedback

and the cyanotype images presented in this article.  
*Cyanotype Component of the Photovoice Workshop*

The photovoice workshops incorporated the cyanotype process as both a creative and pedagogical element. Cyanotype, developed in the mid-nineteenth century, is among the earliest photographic printing techniques. Its introduction in this study drew on the precedent of Anna Atkins' *Photographs of British Algae: Cyanotype Impressions* (Atkins, 2013/2013). Students were introduced to the historical and technical aspects of cyanotype before producing their own prints. This integration of a historical photographic process served two purposes: (a) to contextualize contemporary visual methods within the broader history of image-making, and (b) to provide a hands-on extension of the photovoice methodology. Participants generated cyanotype prints from digital negatives derived from their photographic contributions, reinforcing the link between visual expression and critical reflection.

This approach aligned with the host school's differentiation criteria by fostering interdisciplinary connections across art, history, and research methods. Evidence of student learning and engagement is reflected in the cyanotype prints reproduced in this article and in accompanying student feedback collected during the workshop.

**Appendix C. Figure of Hall (1976a, 1976b) cultural iceberg model (BCCIE, 2020)**



**Appendix D**

**Table 1**  
 The Photovoice Process (Adapted for the Classroom), based on Wang and Burris (1997).

<b>Project Design &amp; Orientation</b>
- Introduce Photovoice methodology
- Define learning objectives and a photographic prompt
<b>1</b>
<b>Training &amp; Ethical Foundations</b>

(continued on next page)

Table 1 (continued)

- Develop visual literacy, privacy, and informed consent
- Responsible image-making and representation
↓
<b>Image Generation (Student Voice)</b>
- Participants capture photographs reflecting lived experiences
- Focus on central theme (e.g., school, community, identity, culture)
↓
<b>Dialogue, Engagement &amp; Critical Reflection</b>
- Structured group discussion (e.g., SHOWED method)
- Collective meaning-making around visual data/images
↓
<b>Thematic Analysis &amp; Narrative Construction</b>
- Identify recurring themes across images and dialogue
- Co-produce captions, narratives, or reflective texts
↓
<b>Knowledge Mobilization &amp; Dissemination</b>
- Exhibit images in educational/public settings
- Share findings with peers, educators, policymakers
- Advance critical consciousness and social change

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