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Visual storytelling and place-based learning: a generative approach to architectural cultural awareness

Amal Fadhil  and Hoda A. S. Al-Alwan 

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ABSTRACT

In architectural learning, it is difficult to stimulate cultural awareness through the traditional education approaches, which results in historic places being neglected as knowledge sources. This research explores the premise that sketch-based visual storytelling may act as a generative approach to connect cognition, emotion, and behavior in historical contexts. The study adopts a qualitative methodology to explore a learning experience comprising two phases: the first is a formal educational setting, and the second is a historical and cultural context, aiming to investigate the role of sketch-based storytelling in enhancing cultural awareness. MAXQDA was employed to code the students' storyboards on three levels of cultural awareness, manifesting a gradual transition of spatial perception to emotional attachment and behavioral involvement. The fourth transformative condition occurred when the three dimensions aligned, enabling an integrated perception through which place meaning was redefined. Findings indicate improvements in students' depictions of architectural details and spatial organization, their emotional reactions to ambiance, and their behavioral orientations toward usage and mobility. Their cultural awareness has been enhanced. The study contributes new findings by positioning visual storytelling as a learning tool, providing a reproducible procedure to incorporate place-based learning into architectural learning as a means to promote cultural awareness.

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1. Introduction

Historical places, despite their rich value, face challenges in being introduced as a living source of knowledge in architectural education. They are often addressed as a static theoretical reference, which limits their ability to enhance cultural awareness. To release their educational potential, new approaches must be adopted to move the learning experience beyond theoretical contexts (Nurdauletova et al. 2024; Üztemur and Dere 2023). Narrative storytelling is one of the effective tools (Darici 2023), to bridge this gap, it connects cognitive, emotional, and attitudinal awareness through reflection and the rebuilding of meaning.

Narratives shape the urban context; they have the potential to revive and preserve its essence and maintain its cultural identity (Fakhrulddin, Al-Alwan, and Fadhil 2023). Visual storytelling contributes to the creative imagery of spatial experiences (Kukkakorpi and Pantti 2021) by integrating drawings with short texts, enabling participants to represent what they see, feel, and desire, as well as their unconscious and subconscious attitudes toward them. It is thus an effective tool that contributes to generating knowledge rather than its passive reception and consumption. Previous


studies have examined the impact of drawing and dual coding – multimodal representations – in enhancing understanding and memory (Wammes, Meade, and Fernandes 2016), while narrative theory emphasizes the role of narrative in developing cultural awareness and fostering a sense of belonging (Clark and Paivio 1991). The current research presents sketch-based visual storytelling as an effective tool for stimulating generative cultural learning by linking cognition, emotion, and attitude of students engaged in historical settings, thereby, exploring the transformation of historical environments into active learning contexts.

2. Literature review

2.1. Learning theory

Multiple dimensions of the learning process have been addressed by learning theories. A fundamental taxonomy was established by Bloom and his associates (Engelhart, Furst, and Krathwohl 1956) when they classified educational objectives into three domains: cognitive, affective, and psychomotor. Kolb (1984) advanced this perspective by framing learning as an experiential cycle that integrates cognition (abstract

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conceptualization), affect (concrete experience and emotional involvement), and behavior (active experimentation). In parallel, the concept of transformative learning is highlighted by Mezirow (1991), which refers to critical reflection and emotional engagement as a potential for learning to achieve transformation, emphasizing that shifts in meaning structures are central to adult learning. Building on these themes, Illeris (2003) developed a comprehensive model including three interdependent dimensions: cognitive, emotional, and social, emphasizing motivation, meaning-making, and social interaction for cumulative, assimilative, and transformative learning, contrasting Bloom's classification system and Kolb's cyclical process.

This view is expanded upon by the modern perspective, which characterizes learning as contextual, life-long, and both formal and informal process. Frameworks such as activity theory, transformative learning, and multiple intelligences highlight cognitive, social, and experiential dimensions, while pragmatist and biographical approaches emphasize the role of lived context (McGray 2011). Active learning is essential to sustainability education. Research indicates that traditional lectures are insufficient; experiential strategies like project-based learning, cooperation, and flipped classrooms foster curiosity, empathy, belonging, critical thinking, and community participation (Molina-Torres and Ortiz-Urbano 2020). Other research on learning architecture suggests that learning environments can integrate behavioral, cognitive, and social learning theories, creating a "learning-friendly campus" that aligns with modern educational practices (Fadhil 2015). Also, a study on campus greenways confirms that walkability and spatial connectivity support sustainable mobility and enhance social interaction, and behavioral engagement in learning activities (Fadhil and Al-Zuhairi 2021)

Place-based education (PBE) utilizes local contexts and cultural traditions as catalysts for holistic learning. There is evidence that PBE improves conceptual knowledge, enhances social attitudes, and cultivates a sense of community. It links cognition, emotion, and behavior with place awareness and attachment and develops a coherent foundation for architectural learning (Gruenewald 2003; Sobel 2005). Apart from place-based and experiential viewpoints, generative learning theory provides an additional perspective that highlights the learner's active involvement in meaning creation. First proposed by Wittrock (1974) the concept that learners do not just absorb knowledge; rather, they actively create it by selecting, organizing, and integrating new material with their prior knowledge. In-depth cognitive processing and long-term retention are both enhanced by the use of generative strategies, such as explaining, mapping, or sketching, according to empirical research that has been conducted after

the initial study (Fiorella 2023; Fiorella and Mayer 2016). Within this framework, visual storytelling via sketching is a generative tool because it enables learners to externalize observations, combine verbal and visual modes, and create integrated and memorable representations of place.

2.2. Historic-cultural place as a learning environment

Historic cultural places serve as powerful learning incubators throughout their integrated cognitive, affective, and behavioral domains. Cultural places integrate tangible and intangible elements, fostering belonging and authenticity (Al-Shami, Al-Alwan, and Alqalami 2023). As a fourth sustainability pillar, culture strengthens identity and continuity between generations (Al-Shami, Al-Alwan, and Abdulkareem 2024). Also, intangible heritage practices show how rituals, together with places' atmospheric, spatial, and architectural features influence how they are perceived and reacted to in space (Al-Ani and AISlik 2023). The multisensory role supports the cognitive encoding of architectural features as well as spatial relationships (Pallasmaa 2024; Zumthor 2006). The emotional and perceptual cues lead to behaviors like movement patterns and engagement. These behaviors are strengthened through attachment to a place and can be seen in intentions and actions within heritage sites (Scannell and Gifford 2010; Zhou, Chen, and Wu 2022). Architectural stimuli significantly shape perception, memory, and behavioral responses (Al-Alwan, Al-Bazzaz, and Mohammed Ali 2022). Place-based education (PBE) is a pedagogical approach that contextualizes learning within local, cultural, and social environments, improving cognitive, emotional, and behavioral results (Yemini, Engel, and Ben Simon 2025).

The cultural and psychological significance of historic sites has been shown in empirical research. Ries and Schwan (2023) argue that their influence stems not solely from physical attributes but also from awareness of historical depth. They also discuss how the historical experiences involve cognitive, affective, and physical dimensions, shaping an integrated experience. These dimensions include attention, imagination, awe, respect, and physiological responses. Dameria et al. (2020) emphasize that heritage sites foster identity, attachment, and dependence. As a result of our interactions with the physical and social environments, our sense of place – which is impacted by cognitive, emotional, and conative dimensions – influences our attitudes towards heritage places. Wang (2023) shows that individuals form bonds to historic places, integrating both autobiographical and intellectual dimensions. The attachments are shaped by the history and characteristics of the place, affecting individuals' enjoyment of urban life. According to

complementary studies on heritage, recognizing historical validity – even with scant physical indications – can generate emotional responses and develop historical empathy, increasing cultural understanding and memory (Ries and Schwan 2022, 2023). Taken together, these insights claim that historic cultural settings are dynamic learning environments where embodied perception, memory, and affect, come together to support meaningful learning and enhance cultural awareness rather than being static artifacts.

2.3. Visual storytelling as a learning tool

The current research proposes sketching-based visual storytelling as a learning tool within a generative strategy in which learners choose, organize, and integrate knowledge into place representations by creating a quick sketch with a caption.

These “sense-making” processes are consolidated in recent research, which also shows the strong advantages of generative activities for comprehension and transfer (Fiorella 2023; Fiorella and Mayer 2016). The use of visual storytelling to create cognitive representations of architectural features and spatial order is supported by empirical evidence that the drawing effect continuously outperforms writing for learning and memory across tasks and settings (Wammes, Meade, and Fernandes 2016). Dual Coding Theory and multimedia learning principles explain gains in learning, with learners benefiting from close-up presentation of words and pictures (Clark and Paivio 1991). All the same, research on storytelling emphasizes its wider educational benefits. While Valle (2021) and Yeong (2016) demonstrate how narratives of place can promote transformative learning by validating lived realities and recreating perspectives, Alterio (2003) highlights how storytelling connects cognition and emotion through reflective dialogue. Accordingly, visual storytelling serves as a tool to enhance place knowledge while also producing outputs that can be interpreted for behavioral (use and movement illustrations) and affective (values and feelings toward place) indicators in architectural education (Ainsworth, Prain, and Tytler [1979] 2011).

2.3.1. Cognitive dimension of visual storytelling

Research continuously indicates that sketching functions as an effective cognitive instrument to enhance learning and memory. Ainsworth, Prain, and Tytler (Ainsworth, Prain, and Tytler [1979] 2011) emphasize that students externalize their understanding and reason through complex concepts and integrate multimodal literacies that go beyond text alone when they create their own visual representations, such as narrative drawings or sketches. From a theory perspective, Paivio's *Dual Coding Theory* demonstrates the idea that information that is coded both verbally and visually

increases learning because it allows for the development of richer, multi-connected memory traces, which in turn allow for recall and mastery (Clark and Paivio 1991). A further line of evidence comes from Wammes, Meade, and Fernandes (2016), exhibiting the “drawing effect” and indicating that creating drawings of knowledge – as opposed to transcribing it – significantly enhances free-recall performance, more than doubling it, even under limited learning settings. In addition to retention, Williams (Williams 2019) indicates that visual storytelling assignments improve visual comprehension by teaching multimodal narrative interpretation and composition. These studies collectively imply that by integrating semantic, visual, and motive processes into meaningful memory representations, visual storytelling and sketch-based activities improve the cognitive aspect of learning.

The cognitive development of learning outcomes can be explained in this theoretical approach as a sequence of three interrelated levels of development. The first is recognition of salient architectural elements (such as arches, geometric patterns, or brick bonding, etc.), which corresponds to the Bloom taxonomy of knowledge and understanding (Engelhart, Furst, and Krathwohl 1956). The second one is the spatial understanding, which involves the arrangement of these components in terms of scale and proportion and spatial relation, in line with what Kolb in experiential learning describes as an abstract conceptualization (Kolb 1984). The third is interpretation, where the learners bring about symbolic and cultural significance to features, and this relates to the story of transformative learning as held by Mezirow, in terms of critical reflection (Mezirow 1991). Sketching in architectural education, therefore, turns into a tool in recording and at the same time, empowering a gradual growth in recognition, creating a sense of space, and cultural interpretation.

2.3.2. Affective dimension of visual storytelling

Although the majority of empirical drawing research has focused on the cognitive benefits related to memory and comprehension (Van Meter and Garner 2005; Wammes, Meade, and Fernandes 2016), less has been stated about the affective dimension of drawing in general and place-based learning specifically. However, as architectural phenomenology explains, the idea of affect can suggest that drawing is a mediator of affective experience. Pallasmaa (Pallasmaa 2024) understands that spatial experience is inherently multisensory; it evolves memory, imagination, and emotion at the same time, while Zumthor (Zumthor 2006) refers to atmosphere experience as an instantaneous affective reaction predating conscious interpretation. Weng et al. (Weng et al. 2024) emphasize that the art of drawing is a lengthy pathway towards exploring the multifaceted depths of human feelings,

made to enable distinctive understandings of the emotional expression of human non-verbal communication. This observation supports the arguments that visual narrative storytelling presents a direct route of emotional appeal and cultural understanding.

In addition, storytelling has been proven to be a source of reflection and transformation. Yeong (Kiaw Yeong 2016) presents evidence that storytelling causes reflection and transformation by taking learners from noticing to meaning making to reconstructing new ways of thinking, thus connecting the practice of narrative to the depth of emotions. Similarly, Valle (Valle 2021) states that narratives of place enable learners to affirm lived experiences, foster a sense of belonging, and reclaim forgotten cultural memories. When students participate in narrative sketching of historical sites, they not only document physical characteristics but also externalize emotions, connections, and cultural significances that words often cannot convey. Thus, both sketching and storytelling become cognitive and affective tools that foster a more emotional connection to place and strengthen cultural awareness through embodied image making.

The affective domain may thus be perceived as a three-ranged continuum of interrelated levels. The former is an emotional response, the first impression of an atmosphere that may arouse awe, comfort, or curiosity, which is reminiscent of the atmospheres listed by Zumthor (Zumthor 2006) and the multisensory phenomenology described by Pallasmaa (Pallasmaa 2024). A sense of belonging is the second level, which is highlighted by Valle (Valle 2021) and Yeong (Kiaw Yeong 2016) as an output of the narratives that create a sense of lived experience and increase place attachment. The third level is that of cultural empathy, where Ries and Schwan (Ries and Schwan 2022) define the concept as the ability to respond to the cultural depth of heritage locales in an affective way. Altogether, these levels are appropriate to justify the affective sub-indicators (applied in this research) to assess the role of visual storytelling in the mediation of cultural awareness.

2.3.3. Behavioral dimension of visual storytelling

While there is limited empirical evidence supporting direct positive effects of drawing on behavioral change, theoretical arguments do offer a strong rationale for exploring such effects. According to Ajzen's *Theory of Planned Behavior*, our attitude, subjective norm, and perceived control are shaped into behavioral intention (Ajzen 1991). Similarly, Scannell and Gifford (Scannell and Gifford 2010) describe how place attachment not only includes cognitive and affective dimensions but also behavioral expressions such as place return, attention, or preservation. Additionally, narrative research demonstrates the important role stories can play

in influencing intentions and actions, not only beliefs and attitudes (Braddock and Dillard 2016). Within this theoretical argument, drawing can be seen as a kind of symbolic and narrative modeling. Bandura (Bandura 2001) shows that symbolic representation orients behavior in the direction of greater self-efficacy and motivation of enactment, while Korpela and Hartig (1996) explain that restorative place experiences contribute to self-regulation and orientation towards care in behavior. In the heritage setting, Guerreiro et al. (Beevor, Campos, and Guerreiro 2022) show how storytelling involves visitors in participatory and co-creative practices that encourage stewardship. Ozkul (Özkul and Gauntlett 2013) connects sketch maps and narrative mapping processes that transform spatial memories into enactments of a personal identity, reconfirming identity and attachment.

Building on this basis, this paper introduces assertive expression as an intermediate stage between the behavioral pathways. The early engagement can be either static or physical interaction, whereas the act of assertion is the step when learners start to express explicit confident actions towards place through cultural self-identification. This perspective is in line with Ames et al. (Ames, Lee, and Wazlawek 2017), who inject assertiveness into a situational competence of situational balancing between autonomy and respect. It also accords with Yoshinaga and Cooper (Yoshinaga and Cooper 2025), who describe assertiveness as a multidimensional construct that allows a social, emotional, and behavioral pathway. Such assertiveness is made apparent in visual storytelling when the students' general expressions are transformed into specific representations through extending description tools towards the cultural context; reflecting beliefs, community, and meaning. Accordingly, visual storytelling is not limited to what is seen, but what is truly felt, relevant, and culturally significant. Finally, this level interposes both the ordinary interaction and deeper-level formulation of agency, what is termed in phenomenological thought as the cognition of oneself being an intentional agent (Gallagher 2000; Haggard 2017) and what social psychology characterizes as the contiguity where the symbolic representations of agency develop into both cultural responsibility and stewardship (Bandura 2001; Pacherie 2008; Synofzik, Vosgerau, and Newen 2008). Altogether, this development displays the evolution of drawings and narratives created by students as simple interaction with the space, more aggressive cultural interactions and, ultimately, agency as the basis of the analysis on which indicators in this study are relied.

To clarify the visual storytelling, Table 1 shows a conceptual summary that links key indicators with the learning dimensions, supported by literature.

Table 1. Conceptual summary of visual storytelling through learning dimension.

Learning Dimension	Key Concept in Visual Storytelling	Key Indicators	References
Cognitive Dimension	Creating architectural knowledge with visual-verbal expression.	Recognition, Spatial understanding, Interpretation	Wammes, Meade, and Fernandes (2016); Engelhart, Furst, and Krathwohl (1956); Mezirow (1991); Ainsworth, Prain, and Tytler ([1979] 2011); Kolb (1984); Williams (2019)
Affective Dimension.	Intermediation of emotional and atmospheric involvement in place through narrative imagery.	Emotional response, Sense of belonging, Cultural empathy	Kiaw Yeong (2016); Pallasmaa (2024); Ries and Schwan (2022); Valle (2021); Wammes, Meade, and Fernandes (2016); Zumthor (2006)
Behavioral Dimension.	Expression of presence, engagement, and emergent agency through performed spatial narrative.	Static presence, Interaction, Assertive expression	Ajzen (1991); Ames, Lee, and Wazlawek (2017); Bandura (2001); Beevor, Campos, and Guerreiro (2022); Braddock and Dillard (2016); Gallagher (2000); Haggard (2017); Özkul and Gauntlett (2013); Pacherie (2008); Scannell and Gifford (2010); Synofzik, Vosgerau, and Newen (2008); Yoshinaga and Cooper (2025)

2.4. Cultural awareness as a learning goal

Storytelling that is based on sketches may significantly improve cultural awareness, which is an aim of place-based learning. This is because it strongly integrates cognitive and emotive processes with cultural transmission. This approach promotes a physiological and phenomenological engagement with space, whereby the act of drawing connects thought, sight, and hand movement to conceptualize and explore spatial ideas (Gomez-Tone and Raposo Grau 2024).

As a “powerful tool for learning, communication, and cultural preservation”, storytelling helps pass on ideas, values, and historical knowledge while also building relationships within communities and encouraging empathy (Darici 2023). In the context of spatial experiences, sketch-based narratives transcend static representation to illustrate how architecture is “enacted and experienced” by users over time, showcasing human occupancy, activities, and the memories ingrained inside places (Theodore 2016). This depiction of lived experience enhances comprehension of how cultural practices influence spatial use (Darici 2023). In the end, interacting with spatial experiences via storytelling in sketches helps to increase cultural understanding by encouraging empathy, questioning preconceived notions, and building a respect for the history, meanings, values, and the culture of a place. It makes it possible for students to understand a place not just as a building that exists in the physical world but also as a rich repository of cultural narratives and human experiences (Theodore 2016).

From this perspective, sketched stories foster cultural awareness on various levels: they foster the awareness and understanding of the cultural aspects (cognitive), and facilitate the feelings of belongingness and empathy (affective), as well as stimulate the caring and stewardship attitudes (behavioral). Eventually, this integrative insight would present cultural suitability as an integrated product of place-based education, even more so, setting the

terms in which it can be operationalized at progressive levels, which will be addressed in the next section of research gaps and contribution.

3. Research gap and contribution

In this research study, drawing-based visual storytelling is conceptualized as a generative learning tool that enhances the pedagogical impact of places in architectural education. In this concept, students create quick sketches and caption micro-storytelling, which serves to strengthen cognitive representations of architectural features and spatial order using processes that are well-supported by research, such as the sketching effect, dual coding, and spatial contiguity. In addition, sketches enhance emotive response by using multimodal enrollment and atmospheres as perceptual interpretive anchors. These narrative outputs also give birth to behavioral tendencies that are theoretically linked to place attachment and, in the context of general learning theory, to attitude – intention – action pathways. Learners’ visual narratives may be used to read architectural cultural awareness and connection to place, and the three dimensions (Cognitive, Affective, and Behavioral) combine to create an integrated framework for this kind of analysis.

Previous studies have generally viewed these dimensions independently or rather focused on cognitive benefits; however, they have seldom conceptualized them into visible steps of cultural awareness. This paper seeks to fill that gap presented by an organized framework whereby visual storytelling will be presented as a medium through which the three domains can be combined into one or other successive transformations of learning.

Figure 1 demonstrates a hypothetical progressive transformation of learning with the use of visual storytelling as a learning tool. The process starts with the three essential dimensions – cognitive, affective, and behavioral – which together indicate how learners acquire knowledge and convert understanding into action (a). In the

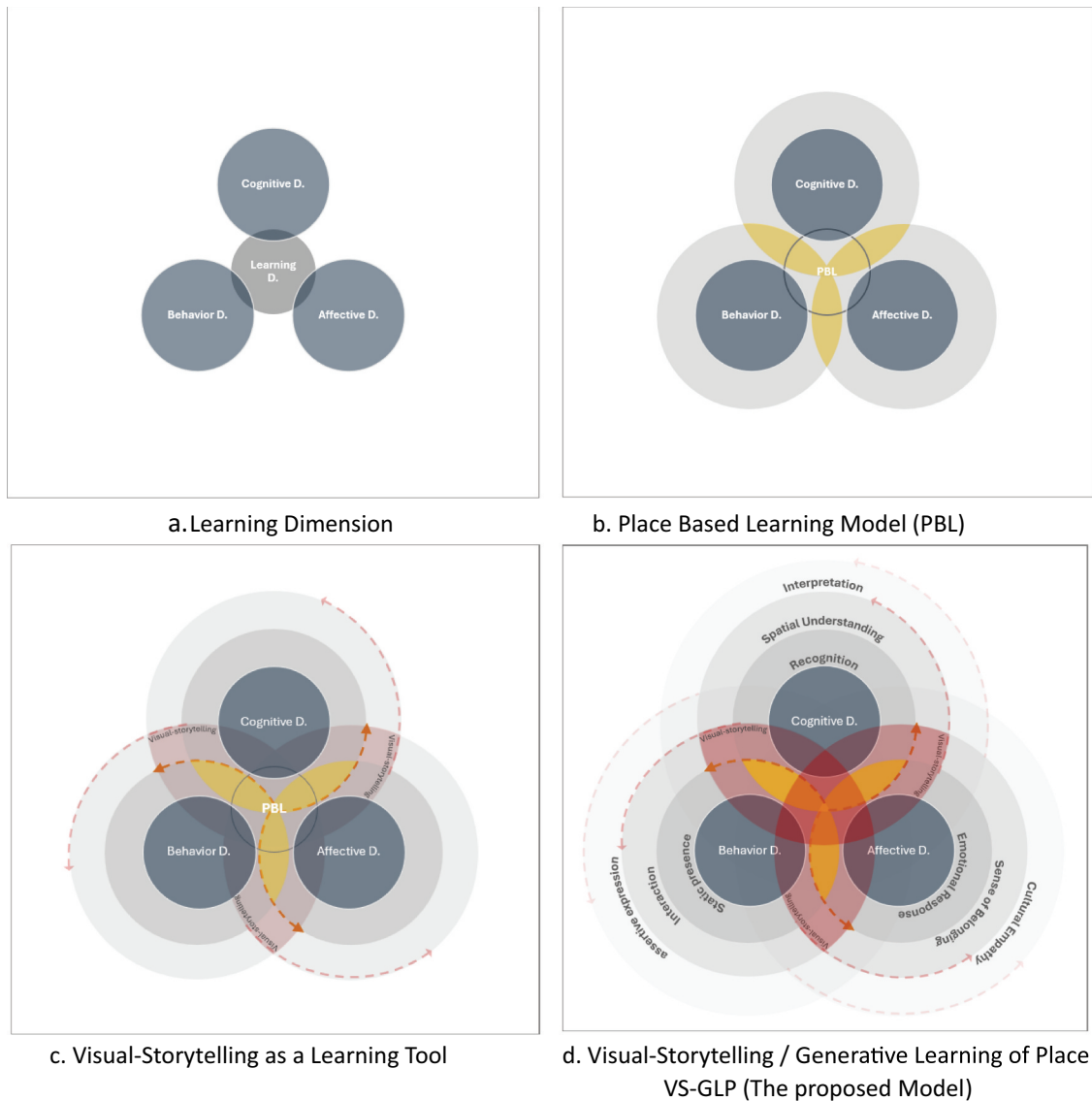


Figure 1. The conceptual framework of visual storytelling/generative learning of place (VS-GLP), authors.

second stage, these dimensions are situated within a cultural or historical context, culminating in a place-based learning model (PBL). The surrounding environment serves as a catalyst for learning, influencing perception by spatial attributes, raising emotional reactions, and directing interaction patterns (b). Visual storytelling becomes a learning tool in the third stage. It links the cognitive, affective, and behavioral domains, generating a repetitive cycle in which perception influences emotion, emotion drives action, and action deepens knowledge (d). The fourth stage emphasizes the generative role of visual storytelling. By sketching and narrating their experiences, learners arrange impressions into meaningful representations. This creative act encourages reflection, creativity, and interpretation, re-creating knowledge in connection to the place (d).

Taken together, these four stages assume that learning is more of a repetitive, contextual process than a static transmission of knowledge. Learners gain cultural awareness and enduring knowledge via visual storytelling, which encourages them to actively build meaning

from their spatial experiences rather than just seeing them. This contribution is further operationalized in four progressive levels of cultural awareness (surface, developing, deep, and transformative), which will be expounded upon in the methodology.

4. Research methodology design

This study utilized a qualitative methodology with an experiential design to study the issue of how cultural and historical settings influence the learning of students. The research process was done in two phases: the pre-visit phase (performed in the classroom) and the site visit phase to a historical setting (Al-Madrasah Al-Mustansiriya in Baghdad). In both phases, students were engaged in sketch-based visual storytelling tasks consisting of structured storyboard drawings and short captions before and after the visit. These outputs were presented in the form of comparative data, which was

systematically coded and compared in an attempt to identify changes in cognitive, affective, and behavioral responses. This approach established the use of visual storytelling not only as a pedagogical tool but also as a research tool, with a potential to increase cultural awareness by involving a learning experience with heritage practices.

4.1. Case study

The Al-Mustansiriya Madrasa was chosen from the architectural, historical, and cultural perspectives as a thirteenth-century educational and cultural setting in the historical fabric of Baghdad (see Figure 2). The madrasa, which is constructed out of brick – a material that is traditionally used in the region – serves as an example of how material in Islamic architecture may fulfill environmental, structural, and symbolic needs. In addition to its architectural expression, it serves as a reflection of the social and religious thought of the period, which means that it is not just a physical construction but also a cultural mirror of what life was like in Baghdad.

Local research on the fabric of Baghdad's heritage focuses on the role of urban morphology and ornamental traditions and sustainable spatial attributes in shaping the cultural identity and social vibrancy (Alsaffar and Alobaydi 2025; Alsaffar and Alobaydi 2025; Fadhil and Al-Zuhairi 2021; Khalid, Abaas, and Fadhil 2021; Mahmood and Al-Alwan 2023). These insights reinforce the value of Al-Mustansiriya as both a heritage site and a dynamic setting where experiential learning can be meaningfully situated.

4.2. Sample size

The research focused on a group of 86 second-year architecture students at the University of Baghdad, who were enrolled in the “Building Construction” course during the first semester of the 2024–2025 academic year. This group was chosen due to the course content's strong alignment with the research focus, which familiarizes students with materiality and structural systems. However, the students' comprehension frequently remains limited to a contemporary approach and an absence of a deeper appreciation for the aesthetic, environmental, and historical significance of local materials. This limitation mostly stems from the students' insufficient awareness of the larger cultural relevance of these items, despite the continuous attempts of the academic staff to use various instructional tactics and instruments to emphasize their value. The integration of the course curriculum with an actual activity in a historic context is deliberately educational, with the ultimate aim of enhancing their understanding of traditional building techniques and cultural heritage.

The two phases of the research were formally planned as part of an approved learning collaboration between the researcher and the course instructors. There were 73 students present during the pre-visit lecture and 55 students present during the second-phase guided field visit. Despite the reduction in attendance during the second phase-site visit, this trend resembles a broader issue also observed in local studies, which suggests the necessity to rejuvenate the interest in and engagement with the cultural heritage of Baghdad to sustain its identity and life (Al-Shami, Al-

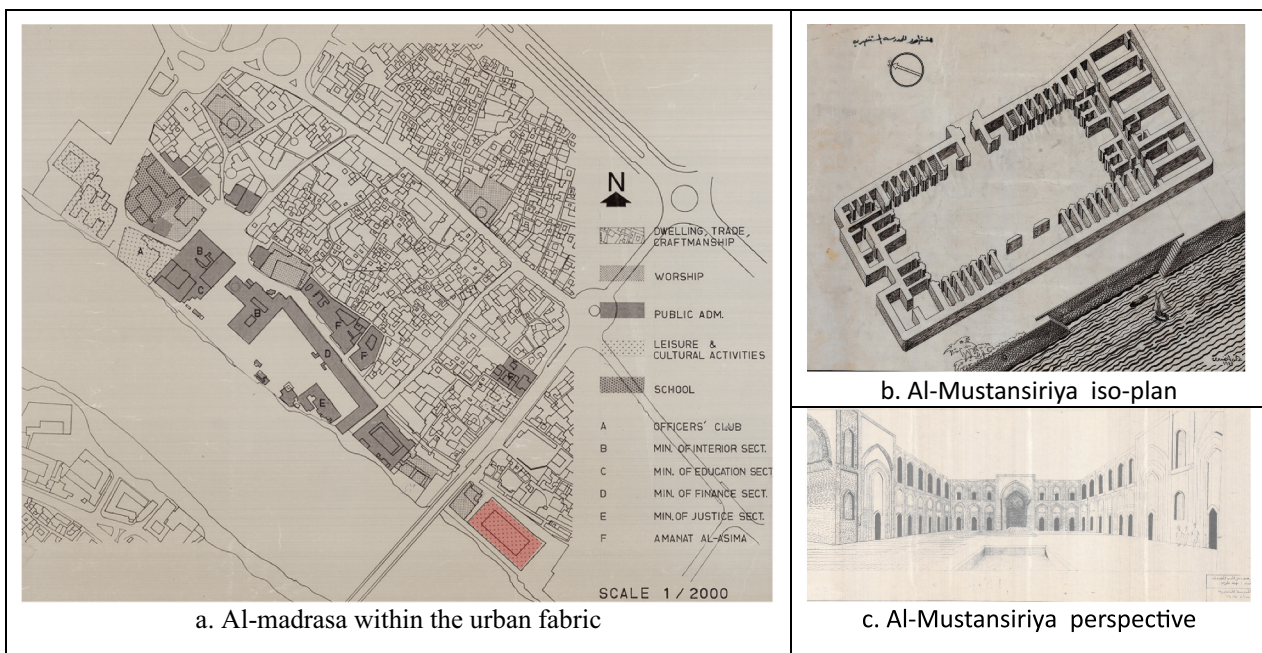


Figure 2. Al-Madrassa Al-Mustansiriya. Source: the Iraqi State Board of Antiquities and Heritage (SBAH) (unpublished archival material, 2024).

Alwan, and Alqalami 2023). Only those who passed through all the phases were retained to be analyzed so that a final dataset of 49 could be obtained. This sample was a reflective sample of those who participated in the experience cycle to the fullest and had a comparable pre- and post-visit storytelling output. Since qualitative sampling centrally focuses on depth of engagement and meaningful insight, rather than on representativeness (Creswell and Guetterman 2019). To put it simply, it is justified to retain only those students who went through the entire series of activities.

4.3. Data collection

Two structured forms were used to gather the data, which were pre- and post-assessments before and after the site visit; see Appendix C (Research Instrument form). In every form, students were instructed to create three captioned sketches devoted to (a) coming to the madrasa, (b) studying in the iwan, and (c) reflecting in the courtyard.

During the pre-visit phase (conducted on 27 November 2024), the students participated in an interactive lecture, which is part of the “Building Construction” course, presented by the researcher in the presence of the course instructors. The lecture was devoted to the brick as a local material used in the architectural designs of Al-Madrasah Al-Mustansiriya with its structural, environmental, aesthetic, and symbolic aspects to create awareness about its cultural meaning. The pre-visit form was then filled out by them, with the students externalizing their knowledge in the form of sketch-based storytelling. During the post-visit (conducted on 4 December 2024), students participated in a tour of Al-Madrasah Al-Mustansiriya guided by a heritage expert and then completed sketching assignments under the supervision of the researcher and academic staff. Based on both; the expert description and the multisensory experience of the site that they had, the students were able to fill in the post-visit form with the same prompts. The two collections of outputs provided similar data to be

used in analyzing cognitive, affective, and behavioral learning aspects in the VS-GLP framework, where visual storytelling was used as a pedagogical as well as a research instrument.

Informed verbal consent was given by all the students before participating in the pre-post visit activities. The purpose of the research was presented in a clear way, and the students were assured that their involvement was on a voluntary basis and that their answers would be anonymous. No written consent was to be used, since the study was considered minimal-risk educational research.

Figure 3 illustrates these activities, including the expert tour (a), students’ group drawing sessions (b), and the production of individual place-based sketches (c).

Appendix A (Table A1) compares students’ pre- and post-visit sketching. Each pair shows the way planned directions helped students express arrival, study, and reflection. These instances contrast pre-visit perceptions with post-visit experiences.

4.4. Data analysis technique

The outputs of students were analyzed using MAXQDA 24, based on the conceptual understanding of Visual Storytelling/Generative Learning of Place (VS-GLP), and organized into a three-tier classification.

Tier 1 – Learning Dimensions: The three classical dimensions of learning, cognitive, affective, and behavioral domains, were used as the basic framework.

Tier 2 – Place-Based Indicator Types: Different dimensions were connected at one of the three types of place-based indicators that crossed the model: Perceptual indicators (what is initially perceived/experienced/existing in the scene). Relational indicators (how the learner relates/connects to the spatial context and to others). Interpretive indicators (the way that the learner constructs meaning/values and symbolizes the place).

Tier 3 – Observable sub-indicators: They are the visible elements as actualized in the drawings and commentaries of the students, which run in agreement

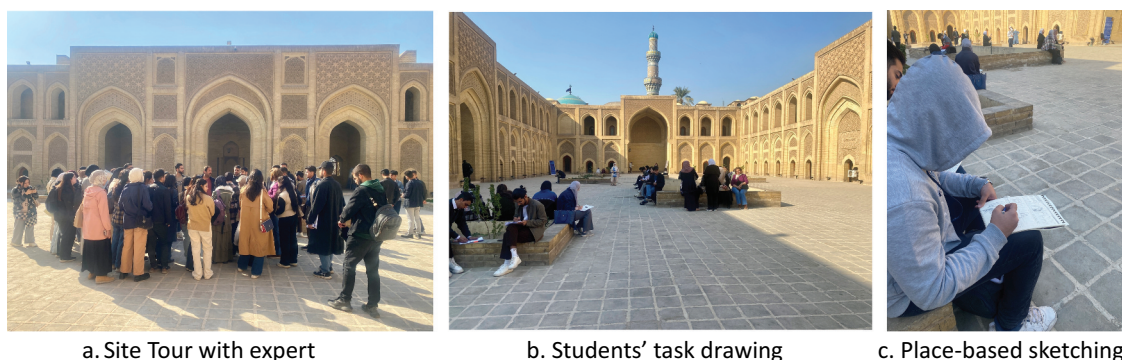


Figure 3. Pre-post students’ activities, photographed by author, 2024.

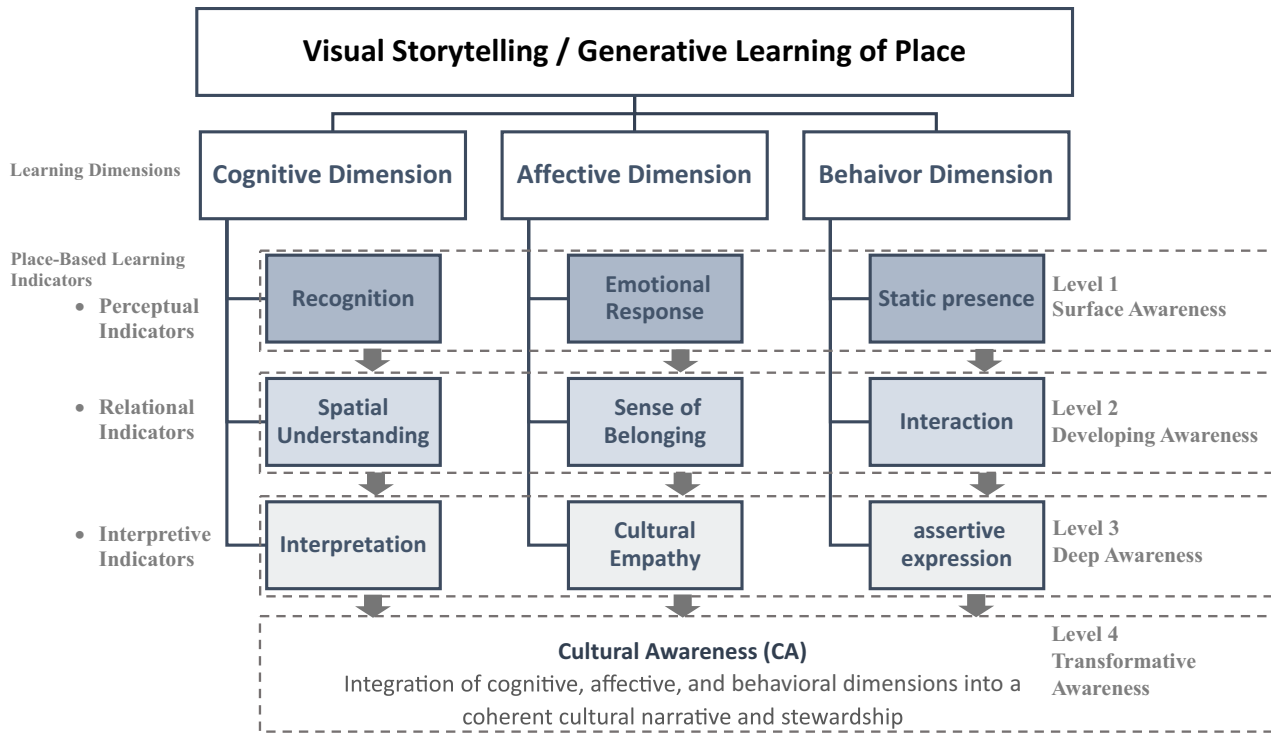


Figure 4. Analytical framework for visual storytelling/generative learning of place, authors.

with Figure 4: *Cognitive* (recognition, spatial understanding, interpretation), *affective* (emotional response and sense of belonging, and cultural empathy), and *behavioral* (static presence, interaction, assertive expression).

A total of 49 students were included in the sample, and all of them had to complete the activities before and after a visit. In order to maintain anonymity, the names of the students were hidden and replaced with the word "Response" (R) and a rising continuation number (e.g., R-1, R-2, and so on, up to R-49). This was a standard form of coding in matrix form and illustrative figures.

All of the sub-indicators were coded on a four-point ordinal scale (0–3), aligned with the framework’s progression of cultural awareness levels: 0 = absent, 1 = surface awareness, 2 = developing awareness, 3 = deep awareness.

A general transformative awareness (Level 4) was identified when it was demonstrated to be integrated in all three dimensions and categories, with an explicit emphasis on the stewardship.

The analytical tool in MAXQDA was a combination of the comparative and visual exploration tools. The coded results compared pre- and post-visits were placed in the Code Matrix Browser, which enabled one to identify the trends of development in the cases. In addition, the visualization of the structural relationships among codes and the representation of conceptual hierarchies of indicators were performed via the MAX Maps tools and Code

Map tools, namely, the Hierarchical Code-Subcode Model and Two-Cases Model. In order to have a sense of analytical transparency, one representative drawing was systematically shown step-by-step on how the identification, coding, and scoring of the indicators took place.

Figure 4 presents the summary of the three-tier group (dimensions, place-based category, and sub-indicator), the four levels of cultural awareness, and shows the layout of the hypothetical analysis framework of organizing the codification and how visual storytelling among students could correlate with increasingly high awareness of place.

The framework links the three learning dimensions (cognitive, affective, and behavioral) with a set of place-based indicators structured into four progressive levels of cultural awareness: Level 1 (Surface Awareness), Level 2 (Developing Awareness), Level 3 (Deep Awareness), and Level 4 (Transformative Awareness). Each level operationalizes cultural awareness by integrating observable evidence from students’ visual storytelling.

In order to increase the transparency of the analysis, the illustration of this process is thoroughly demonstrated in Appendix A (Tables A2, A3), which contains the sketch of the pre- and post-visit, as well as captions of one representative student (R-33, *R = Response). This example demonstrates that the transformation of visual and textual evidence into codes and levels of awareness was achieved with the help of the MAXQDA environment.

5. Result and discussion

5.1. Overall pre-post shift

Based on the analysis of pre-post visual storyboard codes of 49 students with MAXQDA, the cohort demonstrates a tangible increase in the indication levels following the site visit. The overall weighted average of the nine indicators grows from 322 (pre) to 591 (post), 83 percent, compared to an increase in total frequencies by a much lower factor of 27 percent, 269 to 339. Patterns in this dimension show the increase of *cognitive*, *affective*, and *behavioral* scores by 125–287 (129.6%), 112–168 (50%), and 85–136 (60%), (see Figures 5–7). The patterns indicate a shift from surface perception to more meaningful representation. Importantly, the increased returns are in weights, but not in counts, as many indicators (most notably *Recognition* and *Static Presence*) have a ceiling effect in coverage before visit; in other words,

frequency shift cannot change much, but weight reconstruction does (as with generic identification to explicit thresholding, passive stillness to reflecting quiet). In this regard, we use weight as the main analytical indicator of generative learning, and express the aggregate change as the sum of per-indicator (frequency, weight) that are presented in Appendix B (Table B1).

Central nodes represent analytical phase, and surrounding nodes represent indicators with the numerical values depicting the frequency of coding, thus allowing visual comparison of pre/post-visit trends.

5.2. Dimension-level results

On the cognitive level, *recognition* was still covered in cases (49–49 cases) but over and above, it more than doubled in weight (60–124; 106%), showing a transition

Code System	Pre-Visit	Post-Visit	SUM
▼ Cognitive Dimension			0
● Recognition	49	49	98
● Spatial Understanding	47	49	96
● Interpretation	11	34	45
▼ Affective Dimension			0
● Emotional Response	48	49	97
● Sense of Belonging	21	30	51
● Cultural Empathy	18	32	50
▼ Behavior Dimension			0
● Static presence	49	49	98
● Interaction	25	35	60
● assertive expression	1	12	13
Σ SUM	269	339	608

Figure 5. Code-subcode System (PRE-POST) by frequency.

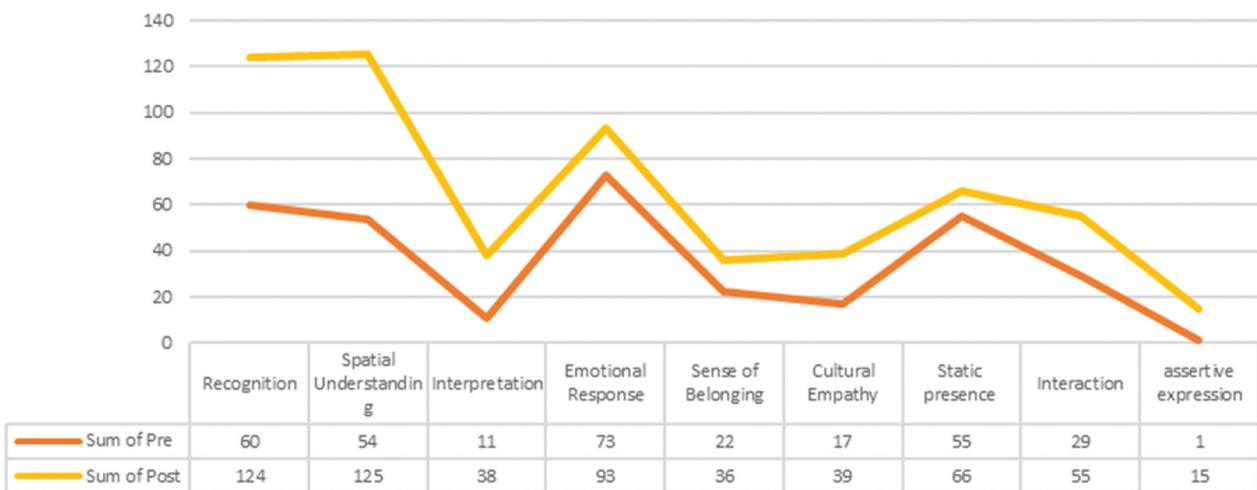


Figure 6. Code-subcode System (PRE-POST) by weight.

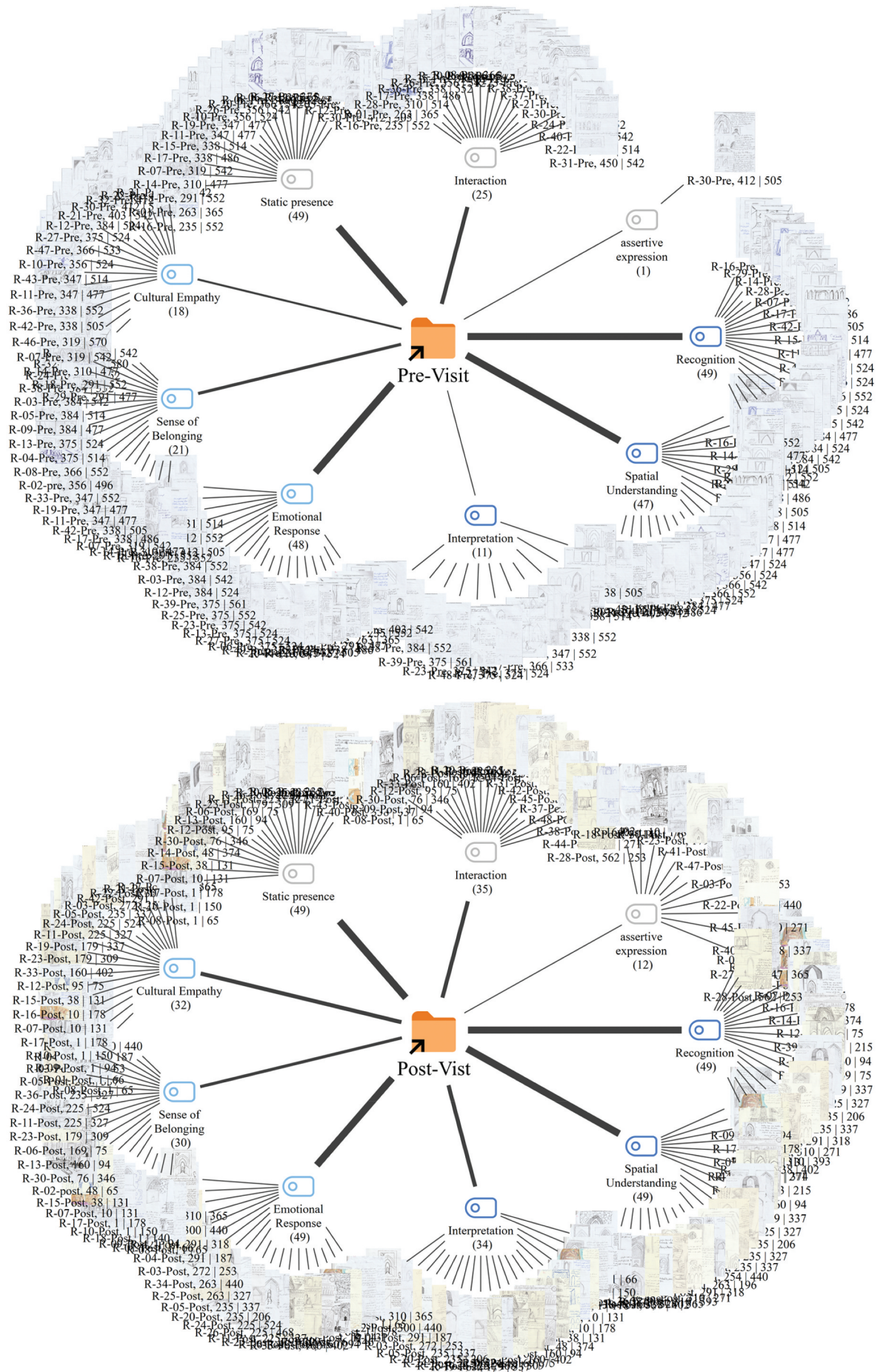


Figure 7. Single-case model (PRE-POST) by frequency.

between generic identification and explicit thresholding and cueing. *Spatial understanding* passed through the state of near-saturation to full coverage (47–49), followed by a radical increase in weight (54–125; 131.5%), which showed the reorganization of the perception into the articulated spatial relations (depth, rhythm, proportion). The most significant cognitive development was in the area of *interpretation*, expanding both in coverage (11–34) and weight (11–38; 245.5%), a shift in types of description giving way to functional-experiential inference (refer to Figure 8).

Emotional response, which was already extensive (48–49) but had a significant addition of weight (73–93; 27.4%), and *sense of belonging* were expanding (21–30) and fortifying (22–36; 63.6%), which is a shifting social presence to environmental affinity. *Cultural empathy* increased significantly in terms of the area of coverage (18–32) and also in weight (17–39; 129.4) as a designator of increased valuation of design cues and heritage (refer to Figure 9).

Statistically, *static presence* was universal (49–49) but gaining in weight (55–66; 20.0%) as a reflection of refraining from silence as an act of passive waiting to a reflexive quiet. The *interaction* increased (25–35) and almost doubled the weight (29–55; 89.7%), which was reflected by interactions with paths, thresholds, and sequences, but not passing over. At last, *assertive*

expression came about the almost non-existent numbers to a significant figure coverage (1–12) and weight (1–15; 1%), indicating similar tendencies in authorial focus and selective foregrounding (refer to Figure 10).

Together, these indicator-specific patterns affirm the existence of post-visit gains in weights and not in counts, with the largest to be found in *interpretation*, *spatial understanding*, *cultural empathy*, and *interaction*—namely, the indicators that build the meaning.

5.3. Cultural-awareness levels (L1–L3) and the inferred transformative condition

The supporting data suggest that there is a change in a cohort-wise regression of *surface awareness* (L1) to *developing/deep awareness* (L2-L3) after the visit. *recognition* (RC), *static presence* (SP), and generic *emotional response* (ER), that is, noticing things and being present, are dominant in the framework and thus irrelevant to organizing relationships and giving meaning. L2 develops when *spatial understanding* (SU) and *interaction* (IN) are being put on the agenda, which can often be complemented with a *sense of belonging* (SB): students move from individual perceptions and pass on to expressed spatial relationships, thresholds, and pathways to the experiences. L3 is achievable when the

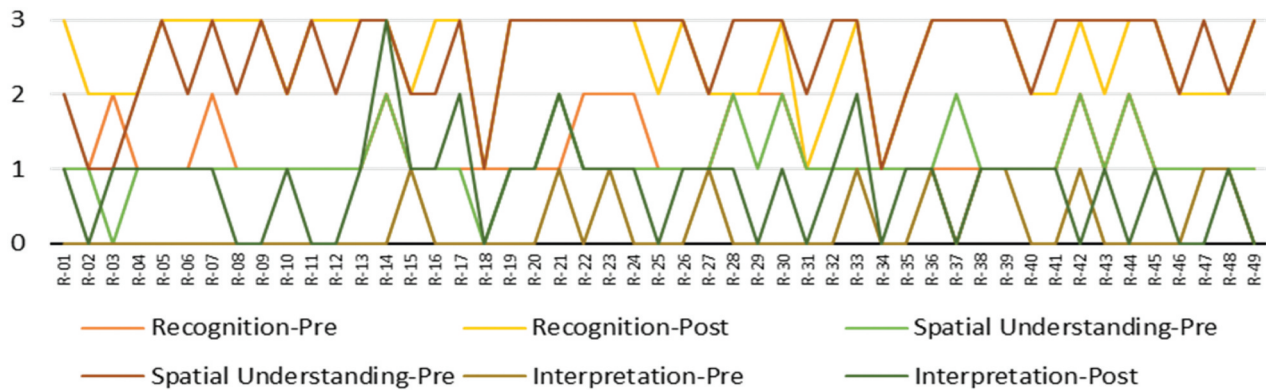


Figure 8. Cognitive dimension.

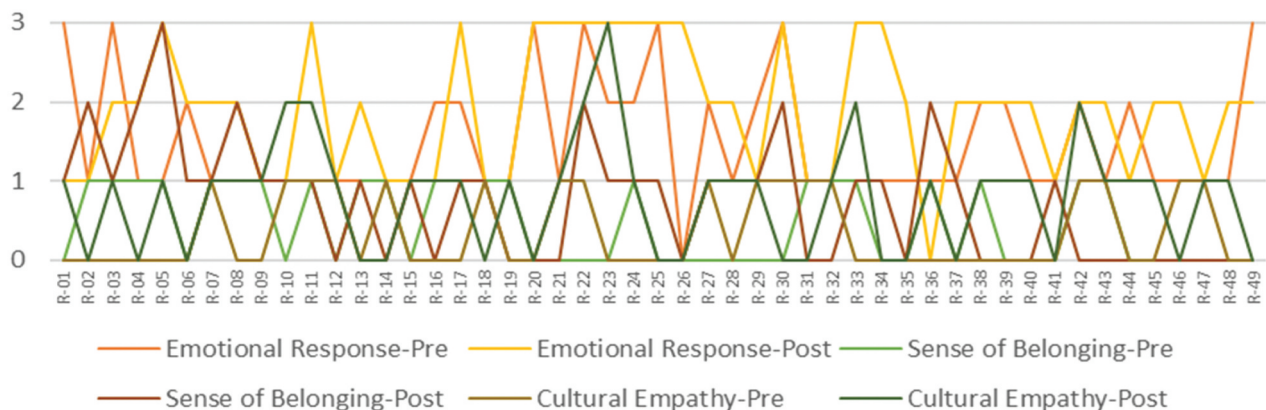


Figure 9. Affective dimension.

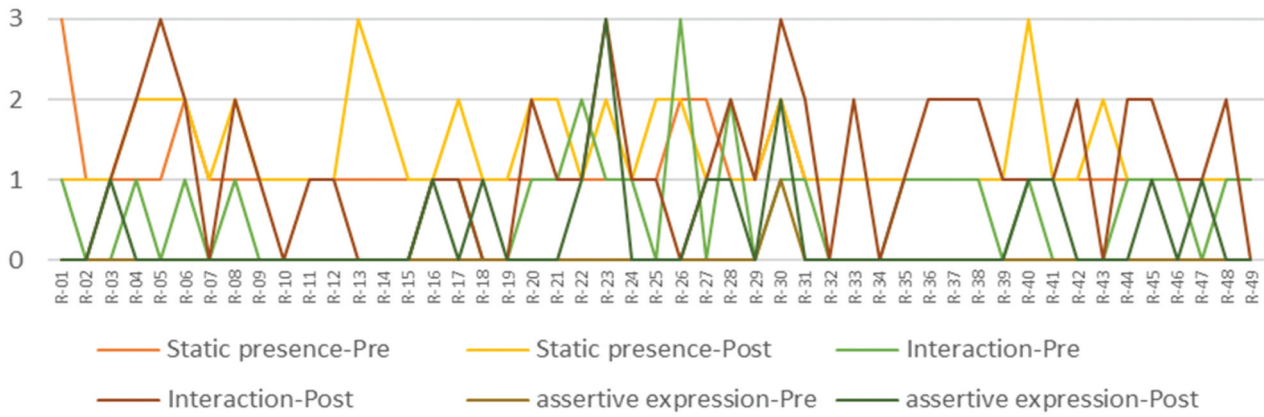


Figure 10. Behavior dimension.

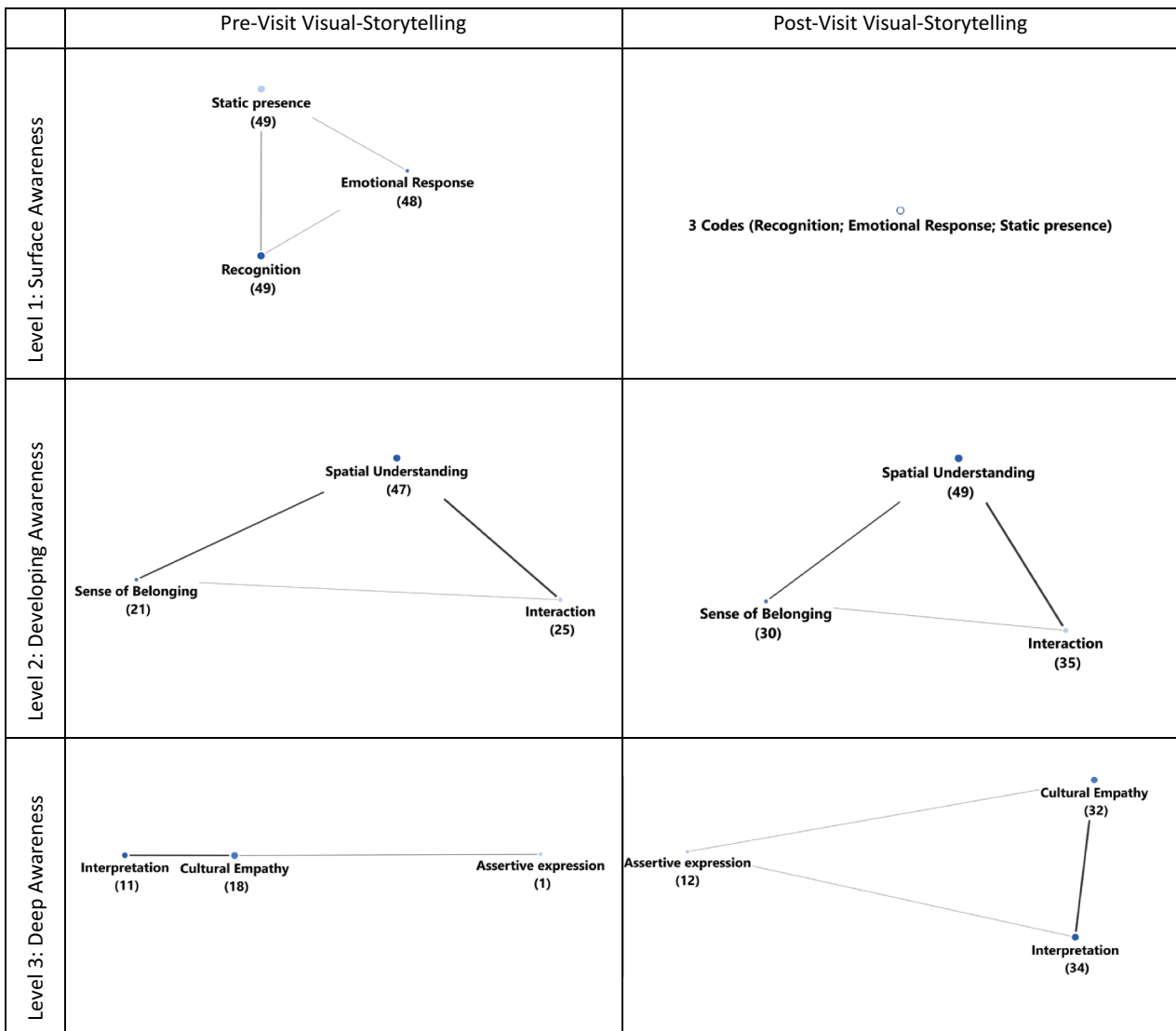


Figure 11. Code map – cultural awareness levels.

interpretation (INT) is present, where form is linked with function/experience and where it is combined with either *cultural empathy* (CE) or *assertive expression* (AE). These changes highlight the advantage that it no longer describes but involves the

articulation of a reasoned meaning and selection of emphasis (what to foreground and why).

Code maps (Figure 11) are visualizations of co-occurrence networks between indicators contained in the work of students in the visualization of MAXQDA. The

pointer labels on a node represent the indicators; the findings are shown by milder lines using darker colors, which signify that there is strong co-occurrence between the same storyboard. Similar nodes are nearer, meaning that they appear more frequently. These maps represent associative, not causal co-occurrence.

It seems that in Level 1, a stable base triad *recognition, static presence, and emotional response* pull tightly, meaning that it is an attentional presence and an overall feeling without the establishment of spatial relations or other meaning assignments.

Level 2 There is a central place at the level of *spatial understanding* in which *interaction* and *sense of belonging* interact. The links in the pre-visit map are comparatively light, particularly SU-SB, and in the post-visit map, these links become thick; the pictures appear to have been isolated to well-coordinated pathway and passages that create a sense of confinement and comfort.

On Level 3, *cultural empathy, interpretation, and cultural expression* are weakly related, and *assertive expression* is at the edge. After the visit, a triangle is evident, the strongest connection being between *interpretation and cultural empathy*; students are increasingly linking functional/experiential explanations to heritage and craft. The other relationship, though with lighter edges, is the one between *assertive expression* and both (*cultural empathy, interpretation*), indicating the emerging source of authorial voice that is yet to be fully scaffolded.

The fourth level (transformative) happens when the three dimensions are incorporated into one of the storyboards: a high degree of spatial-interactive grounding (*spatial understanding/interaction, SU/IN*), a clear interpretation of meaning and cultural empathy or assertive voice (*interpretation* with CE or AE), and a caption that consists of a brief value-based assertion. This being a synthesis of answers, we do not encode it as an additional depiction of numerical outcome and report it descriptively.

6. Conclusion

The study has shown that sketch-based visual storytelling is capable of being a generative learning tool that can revolutionize the interaction of architecture students with historical and cultural environments. This type of approach achieves a deeper level of cultural awareness by incorporating cognitive, affective, and behavioral aspects of the culture beyond mere surface knowledge to incorporate emotional engagement and assertive behavioral reactions to it. The data based on systematic comparison of pre- and post-visit storyboards of 49 students revealed significant improvement in each of the nine indicators, though the largest increase was

seen in interpretation, spatial understanding, cultural empathy, and interaction indicators at the center of the meaning-making and place attachment.

The paper proves that visiting heritage sites alone is not enough to stimulate transformative learning. Rather, there should be intentional integration of such tools as visual storytelling into the pedagogical process to engage multisensory perception, meaning-based interpretation, and identity expression based on culture. Drawing and capturing stories helped the students to make delicate interpretations of the space characteristics, symbolism, and cultural ethics inherent in the design of the Al-Madrassa al-Mustansiriya architecture. Notably, a fourth transformative condition was discovered, and these cognitive, affective, and behavioral responses converged into a sustaining and meaningful manifestation of place, leading to a transition from passive observation to active authorship and cultural stewardship.

More importantly, in doing so, students became not consumers but co-authors of the architectural heritage meaning of the present day, reformulating their configuration at a place in terms of lived, reflective, and creative dynamics. Theoretically, the study is applicable to the gap between place-based education and generative learning and cultural sustainability, as it provides a generalizable framework for the Visual Storytelling/Generative Learning of Place (VS-GLP) model. In its practical value, it justifies sketch-based storytelling as not only a learning and evaluative tool but also a strategy that can be implemented in architecture schools to promote cultural awareness, historical empathy, and spatial imagination.

Though the current research occurs in a specific historical and cultural context, the Visual Storytelling/Generative Learning of Place (VS-GLP) framework is not necessarily confined to the current situation. It is conceptually rooted in known theories of learning and place-based learning that connect the cognitive, affective, and behavioral aspects based on visual storytelling as opposed to context-dependent qualities. Therefore, the framework can be applied to the other cultural, historical or contemporary learning settings where spatial experience and narrative engagement are significant in learning.

With the increasing interest in global architectural education towards the challenge of achieving a balance between technical competency on one side and cultural awareness on the other, this work advocates the pressing importance of reimagining heritage sites not as objects to be studied, but as active pedagogical actors that can train future architects to grow increasingly sensitive to place, identity, and responsibility. Future studies could look into how this can be modified within

the various cultural settings, as well as applied to other creative fields other than architecture.

Author contributions statement

Author 1, Amal Fadhil, contributed to the conception and design of the study, data collection, formal analysis, software coding, visualization, and preparation of the original manuscript draft.

Author 2, Hoda A.S. Al-Alwan, contributed through supervision, methodological guidance, critical revision for intellectual content, validation of the analytical procedures, and project administration.

Both authors have read and approved the final version of the manuscript and agree to be fully accountable for all aspects of the work, ensuring that any questions related to the accuracy or integrity of the research are appropriately investigated and resolved.

Disclosure statement

No potential conflict of interest was reported by the author (s).

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Ethical approval statement

The research was done according to the Declaration of Helsinki. Even though there is no institutional review board (IRB) in the institution of the authors, all the approvals to carry out the educational activities and visit of the heritage site were taken through the official academic and government authorities. Certified administrative procedures by the Department of Architecture – the College of Engineering – University of Baghdad, and the State Board of Antiquities and Heritage, on the research procedures are provided.

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