

Chapter 4

From Visual Culture in the Immersive Metaverse to Visual Cognition in Education

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ABSTRACT

This chapter discusses visual culture in the immersive metaverse through the visual cognition lens. Visual cognition pertains to how we learn through visual means. As educators, we should be aware of how our students learn consciously and unconsciously through the visual sense so that we can help them navigate the immersive metaverse they encounter. Culture and visual culture are discussed. Visual perception, specifically schema and Gestalt, are explained. Learning in the immersive metaverse is as concrete as in the physical world; therefore, teaching students to decode images, perceive the metaverse, and think about images from multiple cultural backgrounds becomes an issue of special importance when education occurs in the visualized immersive metaverse.

INTRODUCTION

If we compare visual and linguistic cognition, then visual cognition seems easier to understand. When we are reading, if a paper is written in a language that we do not know, then we are unable to understand it. However, when we are observing images, we do not wonder if we can understand them but simply decode them through our personal experiences and cultural backgrounds. Today, in the world of connectivity, we see images daily from different parts of the world in the metaverse; however, if our cognition can help us understand or misunderstand the images we see, then, especially in the immersive metaverse, the images are to be questioned. Further, as educators, how we should help our students navigate the visual culture in the metaverse is discussed in this chapter.

Cognitive psychology mainly discusses the internal and internal-external (Hoffmann, 2007, p. 187) processes that influence how we make decisions. Repeated experiences form our internalization (Efland,

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2002; Hoffmann, 2007; Hutchins, 1995), and we apply “dependent cognitive ability to a corresponding abstract and implicit knowledge” (Hutchins, 1995, p. 270). Representations, such as sounds, words, and images, become important cognitive tools. When representations repeatedly present a concept, these experiences strengthen the concept and help us form internal cognition. According to Parsons’ theory of cognitive development, we are not born with the ability to understand complex issues, but we acquire it from our experiences (as cited in Efland, 2002). When we face a new environment or a new situation, we utilize our past experiences to instruct us regarding where to go and what to do; this is an example of the internal-external cognitive process (Agre & Horswill, 1997). As we gain more experience or knowledge, we develop faster cognitive processes.

According to cognitive psychology, we can only understand visual images based on the information we have stored previously. As Freedman (2003) notes “Even our unconscious eye movements are detected by the search for information that will help to make sense of the stimulus based on our previous knowledge” (p67). Even images we have unconsciously perceived, if viewed repeatedly, are stored in our long-term memory and influence how we will perceive similar images in the future (Barry, 1997; Hoffmann, 2007; Kellogg, 1995). According to cognitive psychology, through visual experience we learn the repeated images around us (Hoffmann, 2007). As Hoffmann (2007) states, cognitive systems are semiotic systems: “systems mediated and constituted by signs and representations” (p. 202). Freedman (2003) notes that when we are viewing, we access knowledge from the hidden unit of our neural system to find the corresponding memory or knowledge to develop the connection between the object we are viewing and ourselves. Krampen (1990) additionally posits that images we are viewing convey “second hand information” (p. 81). Viewers utilize previous experiences to make connections with the image they are viewing; however, when image producers make images, they employ their past experiences to create new images and attempt to connect their experience to the viewers’ experience. When viewers see an image they have not seen before, they are establishing a new experience initiated by the image creator’s construct and understanding it based on their own personal and cultural experiences.

Images are generated through physical eyes and the cognitive process. Visual cognition, as Williams (2006) states, “operates on preconscious levels to process visual information into knowledge that motivates behavior before the conscious processes of the neocortex receive or understand the information” (p. 35). When we are processing images in our brains, visual perception allows us to gather information; through the visual perception processes, we utilize cognition to lend meaning to the image we see (Bogdan, 2002). Below, I introduce the visual culture phenomena in the immersive metaverse to develop the foundation before returning to cognitive psychology in the immersive metaverse.

IMMERSIVE METAVERSE

Immersive metaverse is networked environments connected with multiple computers, multiple users, and multiple sets of data (Aukstakalnis, 1991). However, immersive metaverse does not include the entire cyber environment that is connected through the internet. Immersive metaverse is visually presented in a three dimensional realm where social interaction and communication are of primary importance. Users of the virtual world present their virtual selves through customized avatars. In an immersive metaverse, residents can also express their creativity by building 3D animated objects and designing 3D environments (Stephen, 2007; Sturken & Cartwright, 2004).

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Immersive metaverse has been adapted as educational environments, including High Fidelity Open Source VR, Engage VR, Minecraft, and Cloud Party, Open Simulator, but the most renowned immersive metaverse for education is Second Life (2019). Second Life is owned by Linden Lab (LL), and users are able to purchase virtual land from LL. However, all data are owned and controlled by LL, and users must pay to upload textures, sounds, and animations. In Second Life there are real world institutions as well as institutions that only exist in the virtual world.

Open Simulator (OS) is another immersive metaverse widely used by educators (OpenSimulator, 2019). OS has the same immersive metaverse environment as Second Life. It is open source software, so any user of OS can install an immersive metaverse on their own computer server. All the OS data are owned and controlled by the server administrator. Because OS can be owned by individuals and depends on the management of the server, users can upload textures, sounds, animations, and even create their own virtual lands for free. Moreover, the adult content, violence, and money transfers found in Second Life can be prevented in OS by the administrator.

Education in Immersive Metaverse: Introduction and Examples

Immersive metaverse is full of educational possibilities. According to Dickey (2005), “educational MOOs (Multiple User Domains Object Oriented) promote an interactive style of learning, collaboration opportunities, and meaningful engagement across time and space” (p. 440). Another powerful effect of the immersive metaverse is visual stimulation. The visually animated immersive metaverse captures the interest of students who are already digital natives, making them willing to spend more time in it (Carpenter, 2009; Sweeny, 2009). Everything students do in the immersive metaverse can be a learning experience, and learning by doing or learning by seeing fosters self-directed learning (Garris, Ahlers, & Driskell, 2002; Dewey, 1934).

In the immersive metaverse users can see all cultures represented in one place. Users may be able to also find these cultures in the real world, in fairy tales, in mythology, or in dreams. Some places in the immersive metaverse students may never otherwise have the chance to see or even imagine. Immersive metaverse users could build and interact with the virtual objects. In the immersive metaverse educators are able to join and explore the possibilities of using the metaverse for their class.

Visual Culture in the Immersive Metaverse

Culture is based on people’s experiences and backgrounds; therefore, cultures in the immersive metaverse—in which users originate from around the globe—may be more complicated than real-world cultures (Han, 2015; Han, 2013a; Han, 2013b). Miller and Burton (1994) state “Reality is constructed from what we sense based on our experience, emotional condition, beliefs, and so forth” (p. 66). However, in the immersive metaverse, users encounter not only their own cultures, but also many other cultures that are created and curated by other users or companies.

High Fidelity, which is one example of an immersive metaverse, was created by its users from around the globe, and users can see, interact with, and experience it. The immersive metaverse springs from imagination, and there is almost no limit on creating a new environment or imaginative objects. It is not only a new world to live in and travel through, but it is also a place for people to create their own visual environments and culture (Han, 2010).

According to Heidegger (1977), “a world picture . . . does not mean a picture of the world but the world conceived and grasped as a picture” (p. 129). When applying Heidegger’s theory to the immersive metaverse, people must be aware that the immersive metaverse propagates ideas through images, and users must also be aware of unconsciously adapting and accepting everything that is transferred through the images. Images are not innocent (Mirzoeff, 2005), and as Barry (1994) notes, approximately 80% of human perception is through vision. If a person’s ways of seeing are not precise, they may not notice the full meaning of everything they see. When people see an image, they may attempt to relate their knowledge and experience to the image to make meaning of it (Freedman, 2003). As Freedman states, “an expressive object, regardless of the meaning of the production for the artist, does not have inherent meaning; the experience of an audience with visual culture makes it meaningful” (p. 69).

Culture

Culture concerns who we are and how we live our lives; therefore, culture is diverse, and each person has more than one cultural identity (Wang, 2001). “Cultural identities emerge in everyday discourse and in social practices, as well as by rituals, norms, and myths that are handed down to new members” (p. 516). Human biological differences form different cultures of gender, race, and age; human psychological differences form different cultures of career, hobby, and religion. Differences in the natural environment influence different cultural lifestyles. As McFee and Degge (1977) note, “culture is a pattern of behaviors, ideas, and values shared by a group” (p. 272). “Each culture has its own individuality and has a pattern that binds its parts together” (Dewey, 1934, p. 349). In other words, people in the same culture share a similar way of thinking, feeling, and acting (Wang; Samovar, Porter, McDaniel, & Roy, 2015).

Some scholars believe that culture is homogenizing, while others believe that cultures shift. While the macro-cultural system influences individuals, individuals also bring their unique subcultures into the community (Shifman, 2013); therefore, culture is not stable (Anyanwu, 1998). Lemke (1993) contends that “autonomous cultural dynamics” (p. 3) are present in human social systems and are interdependent with the system of material processes. “Cultural practices are . . . material processes; they construe meaning and assign valuation, but they also participate in eco-physical couplings . . . and co-evolve over time as parts of a larger unitary eco-social system” (p. 3). Culture is the “result of complex interactions among images, producers, cultural products, and readers/consumers. The meaning of images emerges through these processes of interpretation, engagement, and negotiation” (p. 69). Cultural ideas and values are maintained by visual images because images can communicate, teach, and transmit the behavior, ideas, and values of a culture (McFee & Degge, 1977).

Culture in the Immersive Metaverse

As McFee and Degge (1977) state, the more culture we study, the clearer understanding of our own cultural background we develop. The immersive metaverse is a place for collecting different kinds of cultural memory:

It is popular culture, it is narratives created by its inhabitants that remind us who we are, it is life as lived and reproduced in pixels and virtual texts. It is sacred and profane, it is workspace and leisure space, it is a battleground and a nirvana, it is real and it is virtual, it is ontological and phenomenological. (Fernback, 1997, p. 37)

In immersive metaverses, users arrive from around the world with different backgrounds. Yaple and Korzenny (1989) stress that because of the significant cultural influence from immersive metaverses, fragile cultures could be changed or eliminated by cultures that have more power in the metaverse. McPhail (2002) adds that “electronic colonialism theory posits that foreign produced, created, or manufactured cultural products have the ability to influence, or possibly displace, indigenous cultural productions, artifacts, and media to the detriment of receiving nations” (p. 243). Furthermore, “the processes of immigration and globalization lead to new ‘third’ identities that represent complex and shifting hybridizations of earlier cultural patterns” (Ess & Sudweeks, 2006, p. 181). Cultures in the metaverse are not only flowing across the globe, but they are also creating unique virtual cultures (Han, 2013b).

Visual Culture in the Immersive Metaverse

Vision is one of the most important senses because humans are so readily attracted by images. Immersive metaverse users seek realistic appearances regardless of whether it is a simulated environment or an imaginary world (Han, 2010). In immersive metaverses, “instead of losing sight of the real, the real is being transformed into signs and images. Instead of images colonizing reality, reality is transformed” (Duncum, 1999, p. 306). However, because we are surrounded by visual stimuli in the immersive metaverse, the importance of understanding visual culture in immersive metaverses becomes serious (Mirzoeff, 2005). When users spend time in immersive metaverses, they begin to view the immersive metaverse as reality. Because of the influence from the metaverse, many scholars (Duncum, 1999; Sturken, & Cartwright, 2004; Woolley, 1992; Mitchell, 2005; Geoffrey, 1994) have begun to consider what is real and what is virtual.

Culture is easily transmitted through technology, especially in the metaverse (Smith-Shank, 2007). However, users in the metaverse come from different countries and cultural backgrounds and have different understandings and experiences regarding the same image (Machin & Leeuwen, 2007). Images in the immersive metaverse gain their value from their “accessibility, malleability, and information status” (Sturken, & Cartwright, 2004, p. 139). Images with different meanings coexist in the metaverse, and the relationship between images and users in the metaverse is not simply direct or transparent (Burnett, 2004, p. xiiii). Users in the metaverse learn unconsciously from the images they see, and how they understand images may not follow the original meaning intended by the image creator (Han, 2010). However, regardless of what users see in the metaverse or what they think the images mean, these images influence how they will see and think about images in the future (Burnett, 2004).

COGNITIVE PSYCHOLOGY IN IMMERSIVE METAVERSES

When we perceive images, we integrate our experiences and knowledge with cognitive processes and understand what we are viewing (Williams, 2006), in both the metaverse and the physical world. Because knowledge is based on our experiences, the predominantly important factor in the cognitive process is our personal experience (Efland, 2002), the majority of which emerge from our cultural or sociocultural backgrounds (Brown, 2001). As Chandler (2008) states, sociocultural perception may be different over time or by culture.

Wiley (2003) posits that when multiple images surround us, they may lead us to poorer understanding and distract us from deciphering the central message. In the immersive metaverse, we are surrounded by

images, and while all images contain certain messages, we may not understand what we are observing, and our visual cognition may consciously or unconsciously ignore images. Stephen (2007) also states that “the online interaction is a real experience” (p. 1104). According to Stephen, the physical world experience is maya—an illusion; therefore, our experiences in immersive metaverses are as real as the physical world experience.

Postmodern consciousness is a condition because we are bombarded with a substantial number of images that we have trouble comprehending (Metros, 1999). Because of the immersive environment the metaverse provides, the line between immersive metaverses and reality may become “perceptually nonexistent” (Barry, 1997, p. 61). Lanier states that the experiences in the immersive metaverse may influence our perceptions in both virtual and physical worlds (as cited in Barry). He explains that when users return from immersive metaverses to the physical world, the immersive metaverses become hyper-real, and the physical world experience resumes. Lanier believes that immersive metaverse experience provides an opportunity for people to sensitize their perceptions. He states that “with a virtual reality system you don’t see the computer anymore—it’s gone. All that’s there is you” (as cited in Barry, 1997, p. 60). In the immersive metaverse, our visual representations are different from our real bodies. However, when we look at other avatars in immersive metaverses, our visual cognition may not inform us that the avatars are different from the real people.

Visual Perception

Perception concerns the relationship between the perceiver and the media (Jamieson, 2007), and visual perception could be considered to be the first perception within all senses (Bogdan, 2002). Visual perception involves how people perceive the element of visual media from their eyes to their brains, which mixes with their psychological feelings and sociocultural dimensions until reaching the reflection point (Bogdan). However, the majority of visual perception is processed unconsciously (Hatfield, 2002).

When we utilize our sense of vision, we immediately sense light, color, distance, space, and movement. Through the cognitive process, perceivers comprehend light and color separately (Alhazen, 1989). Different lighting changes the colors of objects and creates different atmospheres. Additionally, light allows people to recognize texture (Hatfield, 2002), and how people understand space and distance also depends on light (Hatfield). Human vision rapidly and unconsciously compares these visual impulses (Chandler, 2008). When the light of the moving object moves through our eyes to our cortical cells in the brain, we recognize that the object is moving. As Chandler (2009) notes, “retinal stabilization and motion detection” provide us the ability to perceive moving things even when we are moving.

After our eyes physically process images in our brains, the visual perception processes begin (Costall, 1990; Landwehr, 1990). As Jansz (2005) states, the first process of visual perception is emotion, and its brevity causes it to go unnoticed. The emotion reflects how people recognize the image and influences what they do next (Efland, 2002). The second phase is “context evaluation” (p. 228). In this period, people reflect on the emotional feeling and begin to appraise how to interact with the image. Therefore, when we encounter media in our daily lives, we emotionally interact with it unconsciously (Barry, 1997). Visual perceptual processes also allow us to understand and discover figures and ground, angle and depth, order and variety, similarities and dissimilarities, nearness or distance, and shapes or lines (Barry, 1997; McFee & Degge, 1977; Pettersson, 1993).

Because our experiences influence how we perceive new things, what we have seen before influences how we will visually perceive in the future (Groom, Dewart, Esgate, Gurney, Kemp, & Towell, 1999;

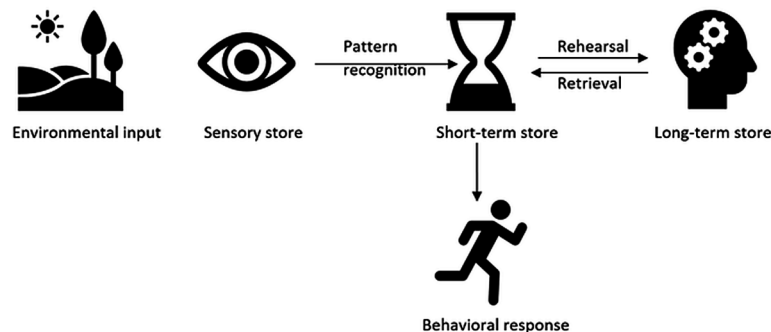
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Orde, 1997; Guenther, 1998). As Landwehr (1990) states, “visual perception is essentially based on the sequential registering of pictures” (p. 3); it is constantly adjusted and repatterned (Jamieson, 2007). It must engage with social and arbitrary signs; therefore, sometimes how we perceive is changed by our previous experiences. In other words, our previous experiences can reform our mental frameworks (Eisner, 1997; Groom, et al; Jamieson). Differences in cultural experience also play an important role in how our experiences influence our visual perception (Guenther; Chandler, 2008). Eisner (1997) states that visual perception becomes increasingly complex and refined as people extend their life experiences. “Perceptual set,” as Murch (1973, as cited in Chandler, 2008) states, is “a predisposition to perceive something in relation to prior perceptual experiences. Perceptual set is broader than situational context, since it may involve either long-term (for instance, cultural) prior experience or . . . short-term or situational factors.” Everything we have ever visually experienced before becomes an element of our future visual perception.

Memory, as experience, also influences how we perceive images. “We become familiar with our environment when we begin to recognize certain regularities in our experience” (Efland, 2002, p. 24). When we repeat our experiences properly, the experience may move to our short-term memory or even to our long-term memory (Kellogg, 1995). Kellogg’s three stores model of human memory (Kellogg, 1995, p. 34) explains how our brains process our experiences into memory.

The environmental input in Kellogg’s graphic can also be explained as media input, or in this case, the immersive metaverse. When media repeat the same image or idea, our brains transfer the image or idea from short-term memory to long-term memory (Barry, 1997). In other words, we do not need to have direct experience to form a long-term memory; our visual perception can transfer images into memories even without our awareness.

*Figure 1. Three stores model of human memory
(Adapted from Kellogg, 1995)*



Helmholtz states that “visual perception is mediated by unconscious inferences” (as cited in Hatfield, 2002, p. 116). Therefore, when we are seeing, looking, or observing the visual environment, whether in the physical world or the immersive metaverse, we are unconsciously perceiving and attempting to understand all visual images (Kellogg, 1995). We selectively see the environment and also categorize all visual images that come to our eyes.

When we visually perceive, our sight is limited by our eyes because they are not multi-directional, which means that a direction of vision must be consciously chosen (Jamieson, 2007). In addition to the

physiological limits, the motivation of viewing is affected by our cognitive selection. We manage and select the minimal visual data when we perceive; therefore, we do not need much data to recognize visual images (Chandler, 2008). Chandler also states that “selective perception is based on what seems to ‘stand out.’ Much of this ‘standing out’ is related to our purposes, interests, expectations, past experiences and the current demands of the situation.”

When we selectively see, we are also categorizing what we are seeing. We assimilate details into one; we utilize our expectations, interests, and emotions to influence how we perceive; and we categorize what we see into verbal categories (Chandler, 2008). When we categorize our visual perception, we make complexity manageable, expedite recognition, reduce effort, make events predictable, support systemization, bond sociocultural behavior, and make the world more meaningful (Chandler).

Schema

In visual perception, schema is as important as seeing. “Seeing only occurs when shaped by the selective screen of schemata, which finally reveal that the world is available only in terms of representation” (Iser, 2006, p. 47). Schema is similar to a mental template that we employ for making sense of what we perceive (Chandler, 2008; Efland, 2002); it is developed from our personal and cultural experiences (Groom, Dewart, Esgate, Gurney, Kemp, & Towell, 1999), and it includes “a huge variety of sensory patterns and concepts” (p. 6). “The schema approach has much in common with the old saying ‘beauty lies in the eye of the beholder’ . . . the more general requirements of schema theory [suggest] that ‘perception lies in the eye (and brain) of the perceiver’” (Groom, Dewart, Esgate, Gurney, Kemp, & Towell, 1999, p. 7).

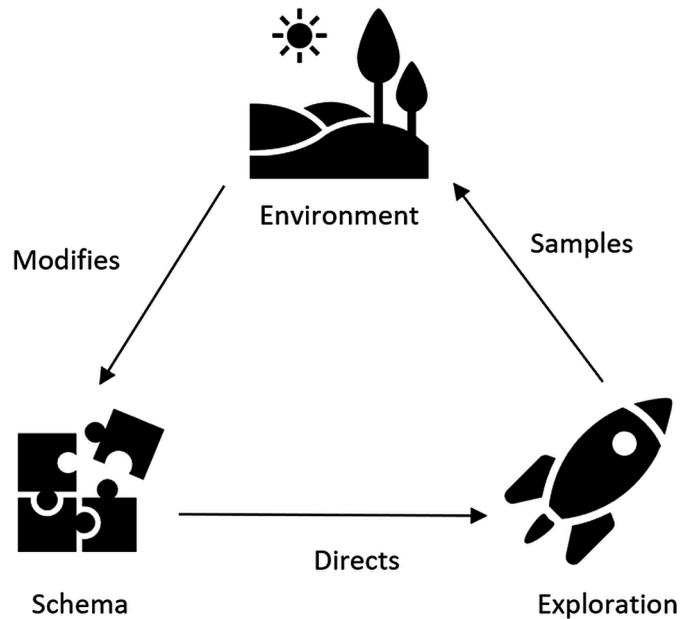
Schema allows us to understand the new visual images from our past visual experiences; in other words, schema fills in the gaps of what we have not seen in our experience. We also make an assumption about what we will see from our schema. When we perceive a new visual impulse, we are also modifying our old schema or forming a new schema structure. Furthermore, schema theory suggests that “our perception and subsequent memory of an input may be changed and distorted to fit our existing schemas” (Groom, Dewart, Esgate, Gurney, Kemp, & Towell, 1999, p. 7); it also implies that people perceive the same image in different ways, depending on their own personal and cultural experiences. As Freedman (2003) states, “An expressive object, regardless of the meaning of the production for the artist, does not have inherent meaning; the experience of an audience with visual culture makes it meaningful” (p. 69). In other words, schema directly forms the structure of knowledge (Kellogg, 1995, p. 18).

Figure 2, adapted from Kellogg’s “Cycle of Perception” (1995), explains our exploration of the environment as connected to our inner schema.

The schema structure enables us “to build models of the physical world” (Kellogg, 1995, p. 18) and allows us to perceive, think, remember, imagine, and reflect different situations. We are not aware of preconscious visual processing; however, “it provides a tremendous amount of information to our conscious mind” (p. 43). According to Kellogg (1995), “Imagery works especially well for familiar, concrete objects that can readily be visualized. Forming images clearly elaborates the words or story events and links them with other images in long-term memory” (p. 135). Because of the preconscious process, as with schema, we may not need to consciously “think” about the images we see.

When the schema structure works in the immersive metaverse, users are attempting to build a new understanding of the world based on their previous personal and cultural schema structures. The new understanding they establish is based on the creation made by users who may not be from the same cul-

*Figure 2. Cycle of perception
(Adapted from Kellogg, 1995)*



tural background. Therefore, they are able to understand the meaning of the image that was intentionally created and curated by the creators who are unknown.

Gestalt

In addition to schema, Gestalt allows us to understand the meaning of images that we perceive (Bogdan, 2002). The difference between schema and Gestalt is this: schema enables us to understand images from parts, but Gestalt permits us to understand the meaning of the whole picture of the image.

In Gestalt theory, two and two do not equal four; the whole is greater than the sum of its parts (Kanizsa, 1979). We do not view an image alone; our eyes consistently add other images or texts to the main image in our perception, or we even add our mental images to the image we are viewing (Groom, Dewart, Esgate, Gurney, Kemp, & Towell, 1999). Further, when we see the same image with a different color or at a different time, the meaning of the image may be totally different. When we see two images combined, the meaning of the whole image may be different. As Kanizsa states, “everything depends on everything else” (p.63). According to Kohler, we “unconsciously and erroneously ascribe certain common characteristics of the visual field to a currently present stimulus constellation because they seem to belong there” (as cited in Katz, 1950, p 19). When we see, we do not see images independently; we see the relationship between the images (Eisner, 1997).

According to Gestalt theory, we interpret images mainly based on our cultural backgrounds. In other words, we learn to understand images based on our cultural experiences (Chandler, 2008; Metros, 1999). According to Chandler, “The Gestalt principles can be seen as reinforcing the notion that the world is not simply and objectively ‘out there’ but is constructed in the process of perception.” Gestalts synthesize

and integrate both visual and mental images (Barry, 1997), facilitate our visual experience to future visual perception, and finally enable us to structure knowledge (Kellogg, 1995).

We are learning from images unconsciously, as Arnheim (2004) argues. According to Gestalt development theory, people with more visual impulses can better employ Gestalt development (as cited in Eisner, 1997). According to Frascara (2004):

Every layout conveys meaning; every meaning presupposes an organization; every organization is based on principles of integration and segregation; principles of integration and segregation are based on the Gestalt principles of similarity, proximity, and good form. Every visual message involves form and meaning. The meaning of a message requires a process of interpretation; and every message is produced to generate an action of some kind. (p. 68)

Therefore, the more images people see, the quicker and better Gestalt development allows them to further perceive the visualized world. However, as noted above, the Gestalt is constructed based on our cultural backgrounds. In the immersive metaverse, it is not clear whether our Gestalt development empowers us to conceptualize the metaverse we are situated in.

COGNITIVE PSYCHOLOGY AND EDUCATION

Because of the important relationship between cognitive psychology and knowledge (Jamieson, 2007), cognitive psychology holds a serious position in education. Eisner and Vallance add a “cognitive process approach” (as cited in Pinar, Reynolds, Slattery, & Taubman, 2002, p. 29) to curriculum orientation and stress the importance of cognitive psychology in education. Hasemann and Reber state that developing cognitive ability is the precondition for knowledge development (as cited in Hoffmann, 2007).

Efland (2002) provides three cognitive orientations in learning: “symbol-processing and sociocultural perspectives, and the view that individuals construct their own views of reality” (p.53). The symbol-processing view is based on the hypothesis that “there is an objective reality that exists independent of the knower, and that it is represented in symbols formed and manipulated by the mind, located in the head” (p. 53). Our mind constructs and creates symbols to represent the world. However, sociocultural cognitive theory assumes that

Reality is socially constructed, that it emerges in and through the communicative transactions individuals have with one another. The mind is thus not in the head, but emerges in the social interactions of individuals, and it is through these that knowledge of cultural norms and practices is both constructed and acquired. . . . Knowledge as cultural content also consists of symbolic tools (language) that enable social interaction to take place. . . . Learning is a process of construction but it is also enculturation through which growing individuals become initiated into their society. (p. 53)

In short, knowledge is constructed not only in each individual’s mind, but also by the sociocultural background. Therefore, learning is based on our sociocultural backgrounds. According to both symbol-processing and sociocultural theories, knowledge is not passively received but is constructed by the learner (p. 72).

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The third constructive theory states that “reality is a construction of one’s own making, that individuals construct their views of reality guided by their own knowledge-seeking purposes. Emphasis is placed on human agency where meaning making is guided by personal interest and effort” (p. 53). This theory combines with the others (symbol-processing and sociocultural) in that not only are we utilizing our minds to construct our knowledge, but this knowledge is also influenced by the sociocultural background.

Piaget and Vygotsky are educational psychologists who apply cognitive psychology to education. For Piaget, “cognitive development is not a passive process but proceeds as a result of actions put forth by the learner” (as cited in Efland, 2002, p. 27). In Piaget’s view, the social environment influences students to interact with others and affects the students’ cognitive development. Students “construct representations of the social environment, which take the form of personal constructions or schemata” (p. 33).

For Vygotsky, “psychology is an instrumental, cultural and historical psychology” (Efland, 2002, p. 31). Culture is the most important factor for Vygotsky because it determines form and content. Only when cultural influences are internalized may higher forms of mental life begin (Efland). For Vygotsky, repeated experience develops internalization; therefore, we depend on cognitive ability to understand abstract knowledge.

Vygotsky uses the terms instruments and tools to refer to ways that human acquire knowledge that mediates their higher mental processes by modifying the stimuli they encounter, using them to both control surrounding conditions and regulate their own behavior. . . . Vygotsky tried to establish how people, with the help of instruments and signs, direct their attention and organize conscious memorization to regulate their conduct. (p. 32)

Human society is made by signs; therefore, conduct is determined by the signs attached to objects. We attach meanings to objects or images and react to those meanings we have attached. In short, we constantly internalize signs that we have restructured.

Vygotsky’s cognitive notion has two main implications in the visual world. First, study of the visual should not be isolated but should be seen as connected to social context. Second, cultural symbols advance human development and create human culture through the usage of symbols (Efland, 2002). Because learning is bound by culture, how instructors teach in the immersive metaverse should also follow the culture that students are familiar with.

Education in Immersive Metaverses

When educators utilize immersive metaverses as an educational environment, what students learn from the images becomes a serious issue. Students may travel in the immersive metaverse as if they were visiting a school campus in the physical world. However, the culture in the immersive metaverse is not the same as the culture in the physical world (Mirzoeff, 2003). Therefore, how students understand, adapt, and apply virtual culture becomes a critical challenge to educators. Because students may arrive from different nations with different cultural backgrounds, intercultural interactions in the immersive metaverse become another challenge (Ess & Sudweeks, 2006). “Culture affects the individual’s response to computer-related system[s]” (Wang, 2001, p. 516); how students collaborate and even communicate in the immersive metaverse without a shared cultural understanding becomes a critical question.

CONCLUSION

“When interactivity is combined with automaticity and the five-hundred-year-old perspective method, the result is one account of mediation that millions of viewers today find compelling” (Bolter & Grusin, 2000, p. 30). Our visual cognition helps us in both the immersive metaverse and the physical world. However, the speed of the cognition process is impossible to manage; we should be aware that we are constantly influenced by all the images we see and attempt to recognize what those images are really telling us before we are unconsciously influenced by them.

Consideration of visual culture in immersive metaverses that are utilized as learning environments should not only focus on the visual aspect of culture, but should also depict, criticize, and sustain the contradictions of different cultures and even include a capacity for culture building in the immersive metaverse (Burnett, 2002; Efland, 2002). However, when immersive metaverse users can build, change, and reform the visual culture in the immersive metaverse, the sources of the visual clues they are learning from are unknown. If educators are not attentive to the diverse visual cultures in the immersive metaverse learning environment, then students may consciously or unconsciously accept the cultural representations or misrepresentations they find (Freedman, 2000; Marciano, 2002). Therefore, teaching visual culture within the learning environment of the immersive metaverse is important.

Learning visual culture in the immersive metaverse allows students and instructors to understand the context of the immersive metaverse. Students are increasingly learning from visual sources (Freedman, 2000; Han, 2015); however, they struggle to understand the broad and deep meanings of the images (Semali, 2002). Visual culture can enable students to understand the issues of “gender, race, ethnicity, sexual orientation, spatial ability, and other body identities and cultures; socioeconomics, political conditions, communities, and natural and humanly-made environments, including virtual environments” (Freedman, 2000, p. 314). Visual culture involves social statements, in a social context, from a social perspective. Learning in the immersive metaverse is as concrete as in the physical world; therefore, teaching students to decode images, perceive images, and consider images from multiple cultural backgrounds becomes an issue of special importance when education occurs in the visualized immersive metaverse.

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KEY TERMS AND DEFINITIONS

Culture: Culture concerns who we are and how we live our lives. Culture is diverse; it is not stable but is a fluid process.

Gestalt: Gestalt allows us to understand the meaning of the whole picture of the image. It instructs us so that when we see, we see the relationship between things.

Immersive Metaverse: The metaverse includes all the virtual spaces that people can access through digital technology. The immersive metaverse specifically involves the metaverse that provides users with immersive experience. It currently includes both virtual and augmented reality.

Schema: Schema permits us to understand images from parts. Schema is developed from our personal and cultural experiences; it is similar to a mental template that we utilize to make sense of what we perceive.

Visual Cognition: Visual cognition explains how people make sense of the world from their visual sense. It discusses the internal and internal-external processes.

Visual Culture: Visual culture is an interdisciplinary area that includes but is not limited to media studies, cultural studies, art history, and anthropology.

Visual Perception: Visual perception is how people perceive the element of visual media from their eyes to their brains, which mixes with their psychological feelings and sociocultural dimensions and finally reaches the reflection point.