The Pedagogical Benefits of Stepping Outside the Perspective Paradigm: Challenging the Ubiquity of Western Visual Culture

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Abstract

The difficulty in stepping out of the prevailing perspectival paradigm by students of design was investigated in a pedagogical exercise. It explores their ability to generate new spatial conventions. In both supporting the notion of the transference of manual perspective as a convention to digital media and offering alternatives to its seemingly reduced expression of experience beyond that of the illusion of depth alone, the exercise described in this paper goes some way towards explaining interaction with 3D media in general.

1. Introduction

The impact of teaching perspective construction in design schools as an educational technology since the late eighteenth century continues largely unchallenged [1, 2, 3, 4]. As a culturally-specific learning tradition it has fostered a particularly narrow world-view. The omnipotence of its reductionist message – that of mimicry – and its ubiquitous broadcasting into every cultural sphere means exploration in culturally alternate visual mediums for spatial representation tends to be inhibited. This paper discusses a pedagogical exercise where students of design were encouraged to transform their understandings about Western visual media – more specifically perspectival media – by attempting to step outside its paradigm and construct alternate visual conventions. In so doing they are better able to understand perspective conventions too. In a cyclical manner this helps also to explain how they interact with 3D media in general.

2. Historical Perspective

Ever since the late eighteenth-century, perspective, and later projective geometry, has been taught in design schools (such as the Ecole Polytechnique, Beaux Arts, Bauhaus etc) as the pre-eminent method for mimicking ‘nature’, or more precisely ‘reality’ [5]. The use of grids and axes, precise decimal measurements and so on, became the ‘obsession’ behind all modern design endeavours to follow. Apart from a brief, but enduring, exploration of the infinitudes of axonometry – which in a manner forecast design using 3D computer graphics – a practical knowledge in perspective construction became a design aim in itself. By the mid nineteenth century school-age children were taught how to draw simple solids in perspective, an important step in the acculturation to perspective as a way of ‘seeing’. According to the architectural historians Alberto Perez-Gomez & Louise Pelletier [2, p304] our (Western) contemporary accepted notions of a Descartian ‘objective space’ emerged from descriptive geometry, and “perspective theory was the invisible hinge systematising its projections.” It initiated the epistemological model for the acquisition of a scientific truth that has made possible the Industrial Revolution, photography and cinematography, panoramas and dioramas, CAD and VR.

This has not happened without its challengers, however [6, 7, 2]. With the advent of the photograph in the mid-nineteenth-century the then scopic obsession in the arts and science led to the extremes of impressionism and pointillism. This was followed, in the twentieth-century, by cubism, futurism, and eventually abstract expressionism. Marcel Duchamp’s early twentieth-century explorations in non-mimetic indexical representation is an example of an alternative reversible projection through his deliberate use of shadows and anamorphism. His work highlighted the ambiguity between perspectival illusion and reality (Tu m’ (1918) comes to mind). It called for a new form of participation from the spectator. No longer a passive observer of an all-revealing perspectival realism, his work reinvigorated allegories of the medieval ritual.
Since then, the computer, and its efficient 3D rendering algorithms, has re-established perspective as the dominant contemporary visual media [8].

The emergence of computer-mediated 3D virtual worlds is the latest extension to the growing arsenal of perspectival media. These 3D virtual-world cyber spaces assumes, uncritically, a theory of perception that is derived of Descartes’ simple three-way axial space. This could be seen as a result of a rekindling of eighteenth-century epistemological perspectivism – a visual culture of revealing a geometric depth in images of nature leading to the establishment of natural laws, and scientific observation as the pre-eminent method for making sense of the world around us [2, 9, 10, 11].

Today’s 3D computer graphics now generate unnatural, abstract objects. Typically, in the 3D visualisation of the sciences, arts, and nature studies, we see regular geometric solids floating in a spatial void including metaphoric molecular structures, more grounded architectural renderings, topographical ‘landscapes’ formed by meshes or voxels in GIS, and complex matrices of columns and rows of variable data, to name only a few [12]. All of these rely on the user’s ability to interpret the three-dimensional perspectival spaces depicted. This use of perspective as a method for viewing a three-dimensional space has dominated Western visual culture since the Renaissance [13]. Few proponents, who adopt a core 3D component as their main graphic user interface, question the premise by which they assume that their 3D interfaces are universally understood.

3. Culturally Alternate Spatial Visualisation

Alternate (though largely not yet digitalised) spatialising visual cultures do exist, however: India has its isometric representation for which a convention exists within a regional psyche for its interpretation; China, on the other hand, adopts a similar technique often in the form of a scroll, which is as much about describing a story with visual clues as it is about depicting a real scene; Japan extends the Chinese scroll by adapting it to an unfolding screen. In so doing, it gains both literal and metaphorical depth; Mesoamerican (Aztec, Mayan, and Incan) art communicates space of cosmic scale in the form of elaborate two-dimensional chartings or mappings often completely filling the surface they are applied to; Australian aborigines hold memories in a virtual space described through abstract dot paintings, dance and song. With few material possessions and no written language, Australia’s Aborigines impart their subconscious ethereal landscapes by projecting them onto the physical world; and, in a similar manner, the ritualistic art of indigenous Africans and Oceania communicates their spatial narratives through carvings, weavings, assemblages, ceremonies, song, dance, and so on. Despite being far from an exhaustive overview, and an over generalisation, of culturally alternate spatial representations, what could we (in the West) learn from these diverse methods? Few are offered by the literature on multi-dimensional representation. Most discussion is primarily from a narrow Western ontological ‘point of view’, which tends to facilitate the perpetuation of popular (mis)understandings of visual media in the West. Indeed, today, the sheer ubiquity of (technologically processed) perspectival imagery threatens to homogenise global visual communication.

4. Challenging Perspectival Norms

In an attempt to address the notion of a ubiquitous over-acculturation to perspectival imagery, 48 CAD/digital media students of design were engaged in an exercise in visual representation. Ordinarily accustomed to designing ostensibly in 3D digital media and its derivatives, this exercise required them to critically re-appraise their visually-mediated cultural assumptions about the universal accessibility of perspective. Design students were chosen because they were already familiar with thinking and working in the 3D perspective paradigm and actively open to exploration of the media. The objective was to explore linear perspective as a ‘learned convention’ and how perhaps it could be ‘unlearned’, thus enabling one to begin to imagine other ways of representing the world around them. Their task was to try and represent the world around them without using perspectival techniques. They were not required to use digital media. In fact, most found that the digital media they were most familiar with tended to inhibit their ability to be creative outside the perspective paradigm. This suggests that digital media, in general, supports only partial exploration outside its prescriptive visual formats – flat screen, orthogonal spaces, shading algorithms and so on.

5. A Pedagogical Exercise in Non-Perspectival Representation

The first-year design students who participated in this exercise were required to challenge their
assumptions about a perspectival world-view by attempting to represent it without the use of perspectival realisms. It succinctly ‘closed the loop’ on what begins in a typical design education curriculum as instruction in the ubiquities of an objectifying perspectival world-view [3]. Concomitant within a perspectivally-oriented design curriculum is the wider sociological conditioning to perspectival terminology. This includes the use of terms such as: ‘point-of-view’, ‘putting things into perspective’, to ‘see through another’s eyes’ and so on. Students were lectured on perspective as a ‘thought grammar’, in Romanyshyn’s [11] terms, and the establishment of a correlation between the omnipotence of perspective and the difficulty in de-constructing its visually-mediated cultural assumptions due to the insidious nature of its terminology having become firmly entrenched in contemporary spoken language.

6. Cultural Transformation

A traditional perspective image has a dual existence – there are the objects depicted in depth and there is the surface of the image itself. In the mid nineteenth Century the advent of photography challenged traditional art forms to reassess the very nature of realism. In response, many late nineteenth and twentieth-century artists questioned the validity of traditional methods and started to experiment with the picture’s surface. What these artists attempted to do was to give back to the surface of the painting a life of its own.

With the response to the realisms of photography in mind, it is perhaps not surprising that most of the participants in this exercise chose abstract expressionism to relay their newly adopted non-perspectival world-views. In so doing, they often also chose an experiential topic which did not readily lend itself to a perspectival view (or execution using digital media), such as: hotness, crunch of an apple, succulence of a strawberry, and so on. They found working in a non-perspectival medium challenging, and their narration of the product’s meaning often caught them borrowing from perspectival terminology – typically use of the term: ‘point-of-view’. They were establishing new conventions for the representation of common things, situations, or themes. In turn, they began also to reflect on their understandings of perspective as merely following certain conventions with predictable outcomes.

Their compositions can be organized in accordance with levels of abstraction. At one end of the range of compositions were the more abstract ones, and at the other end, the more recognisable, symbolic, spatial illustrations. For example, at the most abstract end we find ‘hotness’. This is an experience, not an ‘object’ in the three-dimensional Cartesian spatial sense we normally associate with objects-in-perspective. In this case, the colour yellow was chosen because it makes one feel ‘sweaty’. In attempting to represent ‘things’ without perspective, participants stripped away all illustrative confectionary [12] – to lay bare the essence of the thing depicted. In another case, Crunch of an Apple used a familiar medium, paper. Its texture and the sound it makes when one screws it up was used to communicate familiar sounds of a crunchy apple being eaten. Meaning was conveyed by the simple crumpled paper due to the three-way sensory provision of the paper’s apparent tactile, aural, and visual information.

At the other end, in a more iconic example, Polar Bear in a Snow Storm, the abstract, ordered yet unclear arrangement of, simple though highly stylistic, shapes, beguiled its collective meaning (see Figure 1). Unlike a perspective, which reveals its meaning through mimesis and unification of objects in space, this depiction of a polar bear was concealed by the totality of the picture. The individual elements, whilst appearing to have some significance, even if only through their craft, sufficiently threw us off the ‘scent’. Nevertheless, once the intended meaning behind their arrangement was revealed all were pleasantly shocked and delighted that such a simple execution could evoke such a strong secondary impression. Here we got a glimpse of the sort of power generated daily by advertisers who use recognisable metaphors in quirky ways to delight and excite, commodify, and ultimately commit us to their ideals.

Amongst the most abstract examples, were the evocative, tactile, and action images. They were evocative in the sense that they evoked certain feelings, experiences or sensations in the viewer such as hotness, succulence, or crunchiness. Tactile themes included crumpled paper, dripped paint, heavy...
thoughts, words and imagery. They struggled to find a
the insidious nature of perspective to shape their
exercise displayed varying difficulties in over-coming
mediums. The students who participated in this
of seeing the world through exposure to its various
perspectival techniques. They come to ‘know’ this way
students to imagine a world represented without
perspectival paradigm, its dominance of
visual culture (via photography, television, movies,
digital media, magazine images, 3D animations, data
visualisation, computer games and so on) and all that it
implies (scientific analysis, explanation, and
objectification) [14, 5, 15, 16] has become so all-
pervasive that it is almost impossible for design
students to imagine a world represented without
perspectival techniques. They come to ‘know’ this way
of seeing the world through exposure to its various
media and, more recently, Virtual Reality media. The
transition from a physical world viewed as a
collection of objects in space to the virtual
evironment sharing the same paradigmatic philosophy
facilitates transcendence to another ‘plane’ of lived
space. The plane in this case is the computer monitor’s
screen. The isolation of objects in a void projected
onto its surface is played out in natural representation
of their phenomenological understanding of the world
around them. Due to their thorough acculturation to a
perspectival world-view, it is as if, for all intentions,
the 3D objects depicted on a computer monitor are solid and real.

7. On Reflection

Uncovered by this exercise, was how in the West
the prevailing perspectival paradigm, its dominance of
visual culture (via photography, television, movies,
digital media, magazine images, 3D animations, data
visualisation, computer games and so on) and all that it
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8. Speculations

What this exercise suggests is that perspectival and
its history as a taught convention is implicated in the
way design students ordinarily represent the world and,
in turn, how they perceive and articulate their world-
view in perspectival terms. More broadly, from this we
begin to understand how design students are able to
interpret the 3D CAD spaces they are more familiar
with.

An unexpected outcome of this exercise, and a
subject for further study, is what happens when we
apply the results to speculation on how their
acculturation to perspectival media effects their
interaction with real-time 3D spaces. If it follows that
acculturation to perspective is implicated in the way
they represent and ‘see’ then this may account for the
way these same students can interact with 3D spaces in
general. In other words, if their interaction with real-
time 3D spaces is similarly mediated by cultural
awareness of perspective then what they find in such
spaces is what they expect to find because the
paradigm tends to fulfill their expectations of a
reconstructed (culturally mediated by perspective)
reality – their immersion in such spaces is only possible due to their prior acculturation to viewing
perspectively generated three-dimensional ‘scenes’.

The ideologically dominant role perspective plays
in Western visual thought means alternate strategies
are rarely explored in spatial representation. Indeed,
most scientific investigation is organised as ranges of
axial values which are both derivative of Descartes’ 3-
coordinate space and lend themselves to visualisation
in a 3-dimensional perspective view. The dominance
of perspective in Western visual media clearly has a
long history. This research goes some way towards
demonstrating that the deeply embedded conventional
reliance on perspective in the representation of the
world around us, that can been traced back to Giotto’s
early explorations in the Italian Renaissance [18], has
been extended into contemporary physical and digital
media and, more recently, Virtual Reality media. The
shift to a perspectival view in the time of Giotto
(which witnessed the transition from a medieval spiritualism to Renaissance materialism in the physical representation of perspective) was quite profound. But the shift to photographic perspectival media (in the form of static images and their controlled animation in movies etc.), was perhaps equally profound, as was the more recent shift to digital perspectival media. Of greatest significance is the shift to real-time perspectival media and the emergent notion of VR space as something that can be inhabited and explored. The successive transitions from flat medieval representations of space to space depicting depth; from animated space to real-time navigable space; and (the latest fundamental change) real-time inhabited space, as suggested by this study, it would be interesting to see what radical changes are possible beyond perspectival representations of inhabited space.

What the outcomes of this exercise suggests is that due to a deep acculturation to a perspectival view of the world, design students display all the hallmarks associated with the objectifying realities of perspective on which the spatial ontology of Western societies hinges – that is, perspective as a thought grammar [11]. Further potentially fruitful research would include trying the same or similar exercise with students or others from a non-design background. This would give a better sense of how far these results can be generalised.

10. References