COMMONS OF INSTAGRAM: A SOURCE OF LANDSCAPE AESTHETICS

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ABSTRACT

The challenge with producing design is how to stay attuned and relevant to the needs of the end users. Professionals are required to understand the demands of their users or consumers for their design to work, including the practice of landscape architecture. To address this challenge, methodologies are always developed for target users. This study tries to add to this, with the consideration of social media as a timely source for aesthetic information. Through the landscape qualities found in big data, designers can be able to access a new type of community - the online commons.

For this research, visual content from Instagram shall be translated into aesthetic landscape vocabulary that landscape architects can consider. The main problem was how to establish a method to derive aesthetic vocabulary from the representations found within the images posted on Instagram online. The methodology is segmented into two parts – big data mining and coding, and evaluation with landscape architects. This study suggests a method for landscape architects to be able to align themselves with what the online community deems as aesthetic landscapes. As a profession that produces design, landscape architects must be aware of emerging sources of information such as social media.

1. INTRODUCTION

Patterns make up the landscape. This composition of elements such as landform, hydrology, and vegetation visually create an aesthetic response from an individual. Bell (2012) coins this as the process of pattern perception, where a 'visual vocabulary' is developed. In landscape architecture, it is important to have an acceptable response from users of the design. One way to be able to provide this is through reflecting the visual vocabulary that is familiar to the stakeholders of the landscape, securing their values. This leads to the problem set as the perception of patterns change through time. The aesthetic response, visual vocabulary, and landscape value are affected, which means that the landscape architect must be sensitive to this dynamic phenomenon.

Landscape representation or how landscapes are portrayed through media is the focus of this study as it records visual perception of the landscape. From paintings in the 18th century to photographs in the 19th and 20th centuries (Doherty & Waldheim, 2016), these works become as a source of visual vocabulary. Visually pleasing landscapes shape design and planning of environments such as

pleasure gardens, hunting parks, estates, and national parks (Boults & Sullivan, 2010). For the landscape architect, awareness of these modes guides their design goals and objectives to be acceptable for their target users.

Today, there is a contemporary mode that presents the landscape values of an emerging community – social media. Social media has brought another digital disruption (Aris, 2016) by altering the value propositions of products and services that can be accessed online (Langstedt, 2013). The rise of a new online community, the 'online commons' that willingly shares information online, through various outlets such as – Facebook, Twitter, and Instagram has affected multiple industries (Macy and Thompson, 2011; Content Communities, 2016). Through sorting out this available information, it is possible to extract and analyze the value of an 'online commoner.'

As a source for big data, the study looks into exploring this community that continues to grow and influence in with the daily lives of people (Aris 2016). The generation of a contemporary visual vocabulary can be guided through the extraction of landscape values

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from landscape representations. The process can give insight on how landscape architects align the practice with the values of the online commons. In the academe where teaching methods and materials are constantly updated, learning with what to do with social media information will prepare future practitioners to better understand public values (Ahn, 2011). On the other hand, it also becomes valuable for professionals to integrate social media into their on-going design practice for the same reason. Crowdsourced data has been an emerging source for understanding the contemporary use of the landscape (Havinga et al., 2020;, Tieskens et al., 2018; Van Zenten et al., 2016).

The main goal is to develop a methodology to derive the landscape vocabulary of the online commons from landscape representations found in social media. This goal is met by meeting the following objectives: develop a sampling method that reflects the peak engagement of the online commons, identify images with landscape representation, extract the landscape patterns from the landscape representations, develop a system to assign landscape values on the landscape patterns, evaluate the aesthetics of sampled images by practicing Filipino Landscape Architects, and translate the landscape values into landscape vocabulary.

2. METHODS

The development of the method was through the recommendation of Macy and Thomson (2011) on the requirement that social media studies follow a hybrid methodology that combines traditional methods with emergent data sources. Social sciences studies of data mining combined with visual resource management make up this composite approach.
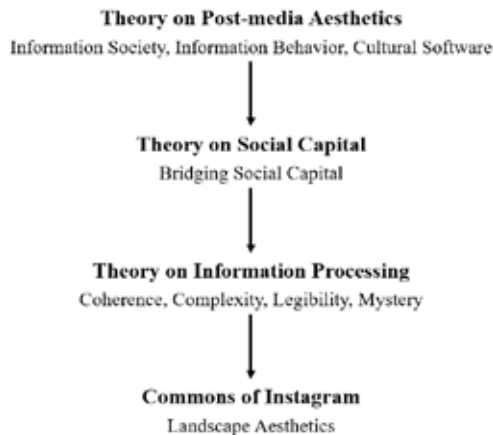

Theory on Post-media Aesthetics
Information Society, Information Behavior, Cultural Software

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Theory on Social Capital
Bridging Social Capital

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Theory on Information Processing
Coherence, Complexity, Legibility, Mystery

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Commons of Instagram
Landscape Aesthetics

Figure 1: Theoretical Framework

Three theories (Figure I) were used to establish a theoretical framework – (1.) theory on Post-media Aesthetics (Manovich, 2001), (2.) theory on Social Capital (Putnam, 2000), and (3.) theory on Information Processing (Kaplan, 1979). These three theories made up the linear direction of the theoretical framework by establishing how landscape values of the online commons were derived. It began by looking at posting images online as cultural software that contains the information behavior of an information society. Through this online engagement, it bridges social capital resource – rich with information that can be assessed with factors of information processing for landscape preference. Following the theoretical framework, the landscape vocabulary was generated from the landscape evaluation.

The social media platform of Instagram was selected as the source of data. It has been a popular platform on sharing images online (Ma & Fan, 2022; Rodgers, 2021; Utekhin, 2017). The image selection process of the study used the location search tab from the Instagram application with the geotagged query "Philippines." The outdoor images that showed up on the most recent section of the app were selected and were extracted manually through a screen capture.

The sampling for the research data was then conducted for seven days following the format of the Selfiecity Project (Selfiecity, 2014), a content analysis study on online self-portraits. Daily, recent images from the geotag query were collected from 8PM to 9PM. The data from this sampling, N=218, was then filtered whether it was acceptable as a landscape image or not. The working definition of this research was to accept images with more than fifty percent of the image as outdoor scenery.

The acceptable landscape images, n=203, were then coded for landscape characteristics within the frame. Distinct landscape elements such as benches, trellises, and trees were identified and counted. Then, presence of the landscape layers foreground, middle ground, and background were counted. Next, the vanishing points of the images were identified if present or not within the image frame. Lastly, the histograms of the images were also read as underexposed, neutral, or overexposed. These image characteristics were evaluated through factors of coherence, complexity, legibility, and mystery from the IPT (Kaplan, 1979) in Table I.

Table 1: Landscape Data Rating System

IPT Landscape Factors	Indicators	Evaluation Levels		
Coherence: 25 points	Presence of repeating landscape elements (ex. trees, benches, etc.)	Yes (25 pts.)		No (12 pts.)
Complexity: 25 points	Number of distinct landscape elements (ex. shrubs, pond, etc.)	More than four elements (25 pts.)	three to four elements (16 pts.)	none to two elements (12 pts.)

IPT Landscape Factors	Indicators	Evaluation Levels		
Legibility: 25 points	Number of landscape layers (foreground, middle ground, background)	three layers (13 pts.)	two layers (8 pts.)	one layer (4 pts.)
	Presence of vanishing point	Yes (12 pts.)	No (6 pts.)	
Mystery: 25 points	Level of Image exposure	Over/under exposed (13 pts.)	Normal (6 pts.)	
	Presence of foreground	Yes (12 pts.)	No (6 pts.)	

The four factors have been provided with equal weights. First, coherence was measured by the presence of repeating elements. Second, complexity was measured by the number of individual landscape elements. Third, legibility was measured by the number of landscape layers and the location of the vanishing point. Lastly, mystery was measured by presence of a foreground landscape layer and the histogram. Landscape values of an online commoner were revealed by adding scores from each IPT factor.

Table 2: Demographic Profile of PALA Respondents

Age group	Number of participants	Instagram Users
Millennial: 18-34 years old	32	81%
Generation X: 35-50 years old	10	70%
Baby Boomer: 51-69 years old	6	67%
Total	**48**	**73**

The next step was performed to compare these values to the landscape values of practicing Filipino Landscape Architects (See Table II). An online survey was distributed to the Philippine Association of Landscape Architects (PALA), the professional organization recognized by the Professional Regulation Commission of the Philippines (PRC). There were 436 PALA members during the implementation of the survey. A total of twelve images were randomly selected for comparison professionals' evaluation. The survey was divided into two parts; first, a blind evaluation of six images based on the respondent's landscape aesthetic with a scale from zero to ten; then, second, an evaluation of another six images with the rubrics and definitions of each IPT factor. For the latter, a five-point Likert scale was provided.

Survey participants were then asked to choose words that describe what the current landscape is. Sixty-five words were selected from the "Illustrated History of Landscape Design" of Boults and Sullivan (2010). These words were selected because the writers used these words, adjectives, to define and describe landscape design from one century to the next, up until this contemporary era. This was undertaken in order to observe the particularities with landscape preferences and visual vocabularies within different generations of landscape architects. An "others" option was also provided if the participant would like to add an adjective to the list.

Table 3: Translation of Word Association Vocabulary

Word	Definition	Translated Landscape Pattern-based Visual Cues
Abstract	existing in thought or as an idea but not having a physical or concrete existence	non-visual
Accessible	able to be reached or entered	with middle ground
Altered	changed in character or composition	anthropogenic theme
Appropriated	suitable or proper in circumstances	non-visual
Artificial	made or produced by human beings rather than occurring naturally	anthropogenic theme
Balanced	keeping or showing a balance arranged in good proportions	good composition of landscape elements; can be asymmetrical or symmetrical
Built	keeping or showing a balance; arranged in good proportions	anthropogenic theme
Collaborative	constructed by putting parts or materials together	non-visual
Contrasting	produced or conducted by two or more parties working together	with anthropogenic and naturalistic landscape elements
Country	state of being strikingly different from something else, typically something in juxtaposition or close association	naturalistic theme
Cultural	relating to the ideas, customs, and social behavior of a society	with landscape elements evoking memory or sense of place

Word	Definition	Translated Landscape Pattern-based Visual Cues
Experiential	involving or based on experience and observation	with landscape elements that encourage user activity
Equilibrium	a state in which opposing forces or influences are balanced	same number of anthropogenic and naturalistic landscape elements
Flat	smooth or even	middle ground is flat
Framed	held in a frame	has depth through a vanishing point or foreground layer
Formless	without a clear or definite shape or structure	no landscape elements
Habitat	the natural home or environment of an animal, plant, or other organism	residential setting
Harmonious	tuneful; not discordant	landscape elements relate to each other
Heroic	having characteristics of a hero or heroine, very brave	non-visual
Hidden	kept out of sight, concealed	with foreground layer
Hierarchical	an arrangement or classification of things according to relative importance or inclusiveness	with complete landscape layers
Honest	free of deceit and untruthfulness, sincere	non-visual
Identifiable	able to be recognized, distinguishable	has a signage landscape element
Inherent	existing in something as a permanent, essential, or characteristic attribute	non-visual
Innovative	featuring new methods; advanced and original	use of technology in the landscape
with Integrity	the quality of being honest and having strong moral principles	non-visual
Leisure	free time; use of free time for enjoyment	with landscape elements suggesting rest and relaxation
Living	alive	with living landscape elements

Word	Definition	Translated Landscape Pattern-based Visual Cues
Microcosm	a community, place, or situation regarded as encapsulating in miniature the characteristic qualities or features of something much larger	with community facilities
Multi-disciplinary	combining or involving several academic disciplines or professional specializations in an approach to a topic or problem	non-visual
Minimalist	relating to minimalism	less than four landscape elements
Mysterious	difficult or impossible to understand, explain, or identify	has a foreground layer, or has over or under exposure
Narrative	in the form of or concerned with narration	has landscape elements suggesting a story
Natural	existing in or caused by natural not made or caused by humankind	dominant naturalistic theme
Original	creating directly and personally, not dependent on other people's idea	non-visual
Organized	arranged in a systematic way, especially on a large scale	landscape elements are ordered
Paradise	royal enclosed park	oasis-like landscape character
Passive	accepting or allowing what happens or what others do	no landscape elements suggesting active use of the landscape
Patriotic	having or expressing devotion to and vigorous support for one's country	has landscape elements with nationalistic characters
Pictorial	of or expressed in pictures	landscape captured with the camera
Picturesque	visually attractive, especially in a quaint or pretty style	aesthetic composition of landscape elements with complete landscape layers
Pleasurable	pleasing; enjoyable	non-visual
Proportionate	corresponding in size or amount to something else	landscape elements exhibit a sense of scale

Word	Definition	Translated Landscape Pattern-based Visual Cues
Recreational	relating to or denoting activity done for enjoyment when one is not working	with landscape elements used for active amusement, enjoyment, and/or entertainment
Reduced	make small or less in amount, degree, or size	a few number of landscape elements
Renewable	capable of being renewed	non-visual
Restored	repaired or renovated	non-visual
Revealed	make known to others	with middle ground, with vanishing point
Scaleless	no appropriate sense of proportion	with only one landscape layer
Smart	integrates technology with the landscape	non-visual
Sunken	having sunk or been submerged in water; at a lower lever than the surrounding area	middle ground with change in elevation from higher to lower ground
Sustainable	able to be maintained at a certain rate or level	non-visual
Symbolic	serving as a symbol	with a landscape element representative of identity
Symmetrical	made up of exactly similar parts facing each other or around an axis	balanced image with similarities between left and right side of central axis
Transformative	causing a marked change in someone or something	non-visual
Thoughtful	absorbed in or involving thought	non-visual
Truthful	honest; telling or expressing the truth	non-visual
Underused	use below the optimum level	no distinct use of landscape
Untamed	not domesticated or otherwise controlled	with unkempt landscape elements
Urbanized	become urban in character	anthropogenic theme
Utilitarian	designed to be useful or practical rather than attractive	non-visual
Visual	relating to seeing or sight; visual perception	composition of image shows depth through landscape layers and vanishing points
Wild	untamed, undomesticated, feral	with unkempt landscape elements

The evaluation ends with landscape vocabulary generation. The same adjectives taken from the reference material (Table III) was translated to characterize visual cues from the four factors of the

IPT (Kaplan, 1979). Non-visual adjectives were not included with the translation. The top rating images were given corresponding landscape vocabularies based on the translations for comparison to the landscape vocabularies provided by the Landscape Architects.

3. FINDINGS AND SOLUTIONS

Table 4: *Sample of Processed Landscape Information*

	Landscape Information		Evaluation
	Coherence	Presence of repeating landscape elements	25
	Complexity	Eight elements: pool, loungers, palm, shrubs, hotel, gazebo, trash bin, row of trees	25
	Legibility	Two layers: middle ground and foreground	8
		Presence of vanishing point	12
	Mystery	Overexposed image	13
		No foreground	6
		Total	**89**

The images are manually coded for raw data such as landscape elements, number of unique landscape elements, type of landscape layers, number of landscape layers, presence of vanishing point in the image, type of exposure, landscape theme, time setting when the image is taken. The processed data follows with the translation of the raw data to rating factors such as coherence, complexity, legibility, and mystery. The summary of both processed and raw can be found on Table IV. Table V shows the summary of ratings from the sampling. The average ratings cover a general range of 67-74 points.

Table 5: *Sampling Results*

Day	Coherence	Complexity	Legibility	Mystery	Total
1	19.3	12.4	16.8	20.1	68.5
2	23.1	14.6	16.3	19.4	73.3
3	19.6	16.0	16.1	18.0	69.8
4	19.6	13.6	15.8	18.3	67.3
5	20.9	14.8	14.9	17.4	68.1
6	19.5	15.4	15.2	18.8	68.8
7	20.5	13.1	15.1	18.9	67.6
Average	20.6	14.1	15.9	18.9	69.5

The online survey was answered by forty-eight Landscape Architects from the Philippine Association of Landscape Architects (PALA). With regards to the number of respondents, the evaluation corresponds to eleven percent of the total registered practitioners in the country. The demographics based on age group and Instagram use are indicated on Table II.
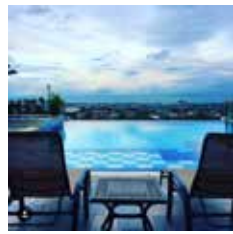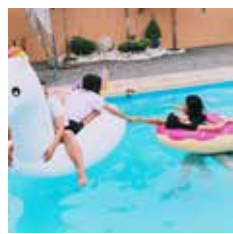
The perception-based landscape ratings show that Landscape Architects rate the images differently from the online commoners. This could explain how professionals would take other aspects of the image for their evaluation outside the visual cues found within the image (Table VI).

After introduction of the IPT concepts within the survey, the Landscape Architects demonstrate an alignment of their ratings with the ratings of the online commoners. Of the six images, the third image on Table VII is inconsistent with the trend; the reason could be that there is a non-visual cultural value that the respondents attach to the image due to its location in a well-known heritage site (Table VII).

Table 6: Comparison of Evaluated Images and Landscape Architects' Blind Perception

Image	Image Evaluation	Landscape Architects' Evaluation
	82.0	43.0
	53.0	56.0
	100.0	58.0
	49.0	60.0
	85.0	45.0
	59.0	50.0

Table 7: Comparison of Evaluated Images and Landscape Architects' IPT-Informed Perception

Image	Image Evaluation	Landscape Architects' Evaluation
	100.0	65.8
	57.0	43.0
	42.0	63.8
	57.0	54.4
	94.0	78.0
	73.0	70.4

Cross-generational analysis of ratings between the demographic age groups provides a trend of general acceptability with both the perception-based and IPT-based components. Table VIII shows the words selected by Landscape Architects that defines the landscape of today and the words identified with the posts of the online commoners. The words that identify with the online commoners are based from the words that define the top rating images from landscape coding from the translated visual cues in the methodology. These visual words were found to be unique for Landscape Architects: 'equilibrium', 'natural', and 'minimalist' while these visual words were found to be unique to the online commoners: 'altered', 'artificial', 'built', 'flat', 'hidden', 'microcosm', 'passive', 'revealed', 'sunken', and 'untamed'. Based on the visual translation for content analysis on Table III, these words didn't match any sampled images.

Table 8: Word Association Between Landscape Architects and the Online Commoners

Landscape Architects' Vocabulary	Vocabulary from Sampled Images
Accessible, Balanced, Collaborative, Contrasting, Country, Cultural, Experiential, Equilibrium, Framed, Habitat, Harmonious, Hierarchical, Identifiable, Innovative, with Integrity, Leisure, Living, Minimalist, Multi-disciplinary, Mysterious, Narrative, Natural, Original, Organized, Paradise, Pictorial, Picturesque, Pleasurable, Proportionate, Recreational, Renewable, Restored, Smart, Sustainable, Symbolic, Symmetrical, Transformative, Thoughtful, Utilitarian, Visual, Wild	Accessible, Altered, Artificial, Balanced, Built, Contrasting, Country, Cultural, Experiential, Flat, Framed, Habitat, Harmonious, Hidden, Hierarchical, Identifiable, Innovative, Leisure, Living, Microcosm, Mysterious, Narrative, Organized, Paradise, Passive, Pictorial, Picturesque, Proportionate, Recreational, Revealed, Sunken, Symbolic, Symmetrical, Untamed, Urbanized, Visual, Wild

Across all groups, the common and unique words also are identified (see Table IX). The common words exhibit similarities with the values in the practice, while the unique words demonstrate the differences on landscape value that can relate to their personal experiences with the practice and further specialization as the vocabulary decreases with age. These personal experiences are the contemporary circumstances that they identify with. The Baby Boomers addressed the post-war development through education and western ideals of classical aesthetics. Generation X had the environmental crisis and the introduction of the eastern ideals to landscape design and planning. Lastly, the Millennials show a diversified vocabulary in search for authentic values.

Table 10: Cross-generational Comparison of Vocabulary with Landscape Architects

Common Words	Unique Vocabulary		
	Millennials	Generation X	Baby Boomers
Experiential, Living, Natural, Picturesque, Pleasurable, Recreational, Sustainable	Abstract, Balanced, Collaborative, Contrasting, Identifiable, Innovative, Leisure, Microcosm, Multi-disciplinary, Mysterious, Original, Transformative	Accessible, Habitat, Minimalist, Renewable, Symbolic, Urbanized	Organized, Proportionate

4. CONCLUSION

The study accepts that social media is the new source for landscape representation. The methodology to gain from the big data that is available through social media platforms was established by creating a hybrid method (Macy and Thomson, 2011) from social media methods of coding, sampling, and landscape evaluation. Through the method, cultural software was established to extract and assess landscape data based on visual landscape patterns embedded within the image. Instagram proved to be a significant resource for these representations as the top image sharing application in Philippine social media.

As professionals in the field of landscape aesthetics, the study presents a method for Landscape Architects to stay relevant in the age of digital disruption. The comparison of blind perception-based ratings shows a disjunction with ratings between Landscape Architects and the online commons, but through the IPT informed ratings, the landscape architects were able to align themselves with the values of the online commons. It is important to note that the study only accounts for tangible visual values and some differences with regards to the ratings provided by the big data method of the study and the values of the survey participants do not look into the cultural values that participants may have with regard to landscape. Also, this presents a good opportunity for people in the practice to be able to study project sites remotely which could especially aid design strategies in situations when in designers are limited to online coordination and collaboration.

The landscape vocabularies show through cross-generational analysis that millennial Landscape Architects have the closest relationship to the online commons. This can be attributed to the different experiences that each generation of Landscape Architects have and are still encountering in their practice. As the practice of landscape architecture will welcome a new generation, Gen Z, with another set of specific generational values, this study becomes a reminder that landscape aesthetics are dynamic and should be investigated further. The study recommends the following: Landscape Architects should update their design vocabularies, the academe should include social media in the discussion of landscape aesthetics, further studies to add culture in valuation of aesthetics, and streamlining the big data mining methodology.

The generation of landscape vocabularies through the coding process, the design of visual cues based on landscape patterns, and the online survey shows that with regards to defining the contemporary landscapes, the online commons have certain meanings that Landscape Architects can integrate with their own landscape vocabulary. The effect of this integration is for the practice to continue to be relevant to the contemporary demands of the public.

Training for social media studies should start with the academe (Ahn, 2011). Landscape Architects begin working on their aesthetics when they enter their academic institution. The form of training can be fine-tuned to also consider a structured method for online valuation of landscape. Currently, students rely on online sources for inspirational images to be part of their mood board, which means that the use of online information is not new to them. Providing them with a new method to sample ideal images can lead to an improved design output that resonates with the online commons.

Culture was not taken into account during the design of the methodology for big data landscape pattern analysis. As cultural values are intangible, the ratings provided by Landscape Architects showed a consideration for culture. It would benefit a further exploration of how culture can be integrated with social media studies to result with a more holistic landscape value that covers both tangible and intangible values such as Havinga et al.'s (2020) strategy for analyzing cultural ecosystem services that focused on the non-visual data extracted from online images.

The limitation that the researchers had to work with was the availability of data mining options. The methodology could be developed with regards to automation as most of the steps of data gathering required manual labor such as sampling through screenshots and identification of landscape patterns. In addition, the sampling process could be re-examined as the recent Covid-19 pandemic could've altered behavior of the public towards the use of the landscape.

The online commons is an emerging resource that Landscape Architects can use (Ma & Fan, 2022; Rodgers, 2021; Utekhin, 2017). The research was able to extract visual landscape values from landscape with the goal of integrating these considerations in the design process. The values were able to reflect corresponding vocabularies that practitioners need to be aware of. The contemporary mode of landscape pattern presented by social media needs to be further studied for the relevance of the landscape architecture in this age of digital disruption.

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