ULT1MART

UMN
UNIVERSITAS
MULTIMEDIA

EXPLORATION OF EXPERIENCE AND PERCEPTION IN USING GRADIENT MAP FOR DIGITAL COLORING

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

Abstract: *This study explores the experience and perception of using Gradient Map (GM) compared to the Direct Coloring (DC) method for digital coloring, particularly among learners. The research addresses whether GM provides benefits in four areas, learning curve, speed, ease of use, and satisfaction for users, and compared with the DC method. The research employed a mixed-methods approach involving comparative experiments using a within-subjects design and a post-experiment survey among 19 participants with varying experience. The experiment required participants to color an image using both GM and DC methods. Results show a near-even split in preference (52.6% for GM, 47.4% for DC), with the majority (84.2%) agreeing that GM is useful. However, the DC method scored slightly better on average for perceived learning curve and speed, and significantly higher for user satisfaction. The GM method was only marginally better in ease of use. GM's benefits include non-destructive editing and fast color experimentation, but its perceived drawbacks relate to the technicality, the multi-step process (value-first), and the need for pre-existing knowledge of value and color theory. In conclusion, GM is a powerful, efficient tool for color editing and*

[1]*Elizabeth Jessica Sentani is a lecturer at Visual Communication Design Program, Jakarta International University (JIU), Cikarang.*

e-mail: jessica.sentani@jiu.ace-mail: minyoo@jiu.ac

[2]*Min-Hyuk Yoo is an advisor at Visual Communication Design Program, Jakarta International University (JIU), Cikarang.*

e-mail: minyoo@jiu.ac

[3]*Eunike Yolanda Zefanya Sitinjak is student at Visual Communication Design Program, Jakarta International University (JIU), Cikarang.*

e-mail: eunikeyolanda24@jiu.ac

[4]*Laura Gebrimova Kolombuto is student at Visual Communication Design Program, Jakarta International University (JIU), Cikarang.*

e-mail: laura24@jiu.ac

[5]*Abigail Tamba Siahaan is student at Visual Communication Design Program, Jakarta International University (JIU), Cikarang.*

e-mail: abigailtamba24@jiu.ac

[6]*Giovani Susanto is lecturer at Visual Communication Design Program, Jakarta International University (JIU), Cikarang.*

e-mail : giovani@jiu.ac

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

experimentation, but its full benefit is realized when users already understand value and color theory. DC offers greater satisfaction and perceived ease of learning due to its directness. Future research should involve a larger, more diverse sample, and incorporate quantitative usability tests focusing on user experience.

Keywords: *gradient map; digital painting; digital colorization; direct coloring; user experience*

Introduction

Digital painting is a process using the tools or application that works with color, lines, shape, and various visual elements (Hibit, 2022). While according to Sani et al (2025) digital illustration technique is a process which mimics the traditional painting, it has the characteristic of smooth gradation in color and rich of texture. As noted by Hibit (2022), some software that are used are Adobe Photoshop, Adobe illustrator, and Procreate. The user can begin by starting with a blank canvas or by applying color elements over an existing photograph or image in the process. Yin (2022) described it as paperless painting, a result of modern science and technology. About its relationship with traditional painting, Yin mentions that while it originates from traditional painting methods, it evolves to possess its own artistic charm (2022).

On learning digital painting process, Kennedy (2024) mentions that digital painting tries to mitigate this by assimilating more traditional feels to its feature and user interface. They try to mimic some of the traditional painting methods such as the brush and color pallette. In hardware, the introduction of the graphic tablet or drawing tablet gives the user the experience to emulate the feeling of drawing and controlling your art by hand. These technologies later evolved to drawing on screen with tools such as Wacom Cintiq, tablets with stylus, and other similar products. The result can be used in both digital media using screen as its display, or in printed media. This technique is widely used in various creative projects because of the flexibility, speed, and their ease of use compared with its traditional counterpart. But, in terms of learning it, there is some challenge found especially in the learning curves in software and hardware (Sani et al., 2025). Kikuchi from 21 Drawing mention, the number of hardware, software, brushes, and settings can be overwhelming for learners to navigate (2023).

In the learning process, digital painting drives a demand for digital painting tutorials, often found in online resources and video platforms like YouTube. One of the recurring themes in these tutorials is the focus on color theory and the application techniques. Some digital artists, reflecting on the traditional method of proficiency in value (light and dark) before moving to pigment, follow this method to their digital works by completing their drawing in grayscale first, and then follow it by adding color with layer blending and styles. These value-first strategies are often highlighted in the use of gradient map.

Gradient Map

Gradient map is one of features in various graphic software that can help users with the colour editing or creation of an image or painting by adding a solid color to the shadow, midtones, and highlight

Exploration of Experience and Perception in Using Gradient Map for Digital Coloring

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

based on the gradient setting (Williams, 2023). It has similarities with traditional underpainting techniques which create a grayscale layer that was created first before colors were applied (Gardner, 2024). This feature allows the creation of a colored image based on grayscale image with the difference only based on value or the brightness. Brunet (2022) mentioned with this, users can work on the value, design, or arrangement first and then give their undivided attention to the colors.

Benefits of using gradient maps were shown in multiple sources. First, the possibility of editing, in Adobe Photoshop, gradient map is a part of the adjustment layer, which allows users to do editing and keep changing it without disrupting the base image created. Combined with other features such as layer blending modes, users can achieve desired color and atmosphere in their compositions (Santos, 2020; Huckleberry Art Academy, 2024; Mohrbacher, 2025; Williams, 2023). Second, its speeds in adding color combination and atmosphere to a grayscale image and process that allow change value to color automatically (Nichols, 2024; Brunet, 2022; Huckleberry Art Academy, 2024; Mohrbacher, 2025). Gradient maps color profile can also be saved in the system and or downloaded from other users, allowing experimental and multiple use of the same color scheme. These advantages in speed and ease of use can provide further help for the creation of digital painting for users.

Disadvantage of Gradient Map

In the topic of coloring itself, not every creator follows the same discourse of using gradient map or underpainting as a coloring technique. Bucci (2018) shares their feeling of disconnectedness, lack of expression, and fun. They also mentioned the feeling of being too technical and prefer to work directly with color. Another

creator, Gardner in their explanation about digital underpainting (2024) talks about using gradient map in underpainting can make you too focused on getting the value and looks right and spending too much time solving an issue that is not yet there. And Heya (2025) in her article about glazing method, even though gradient map is good for experimenting in color, understanding the color expression and layer to use it is crucial, to avoid burnt-out or muddy results if using value and color layer above incorrectly.

For a new learner, gradient map might have its own learning curves as it needs an understanding of not only the layer and adjustment but also the fundamentals of value drawing. Santos mentioned in the making of gradient map achieving a satisfactory result, rather than a loud or tacky, needs an impressive subtlety (2020). It can also take a longer time (Gardner, 2024) which may hinder the painting process. Working with these tools, adjustment, and software can be too technical (Bucci, 2018) and prefer to work with tools that mimic the real world experience like brush and color palette instead. It also needs to be noted that functions similar to gradient map, might not be available to all digital painting software and applications in the market.

This study aims to explore the experience and usage of gradient mapping in users, as well as how the user experiences the learning curves. First, with some claiming gradient mapping as a fast way to colorize and to experiment with color, the research seeks to see whether a learning user experienced this benefit as well. Second, this research seeks to compare on how they perceive gradient map method of coloring with value first and mimicking the underpainting method to color a digital painting composition versus with coloring without gradient map. This research seeks to explore the following questions:

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

1. How is the learner's experience in working with Gradient mapping as a way to colorize and experiment with color in digital painting?

2. How is their experience compared with using coloring directly without using the gradient map method?

Methodology

This research explored the topic of user experience with the gradient map using mixed methods by doing comparative experiments using within-subjects design and survey about their perceived experience. Within-subjects design method allowed the direct comparison of the response of each participant to examine changes or differences (Kaluza, 2023).

The research was conducted in Bahasa Indonesia with participants of various experiences in digital painting. The comparative experiment was chosen to examine the difference between gradient map and non-gradient map method. After the experiment, participants were asked to complete a comparative experience survey using a Likert scale and open-ended questions to share their experience. A review of media and tutorial about gradient map study was also conducted to learn more about the topics.

The experiments were conducted in one computer lab with computers and drawing tablets of the same specification and Adobe Photoshop as the software. All participants had experience in learning and using traditional drawing techniques on paper with black and white value and pigment. Before the experiments, all participants received an explanation of the gradient map feature in Adobe Photoshop and an example of how to use the feature as seen in figure 1. Then, the participants were asked to choose one outlined image provided by the researcher shown in figure 2 as their coloring base, then

they were asked to spend 45 minutes to coloring half of the images using direct coloring, followed by 10 minutes break, and another 45 minutes coloring the other half of the image using gradient map method, (examples shown in figure 3). This experiment involved 19 participants with various level of digital painting experience within the span of two days. The participants were divided into two batches, first 8 people on 14 October 2025 and 11 people on 17 October 2025. The surveys were done after finishing the experiment.
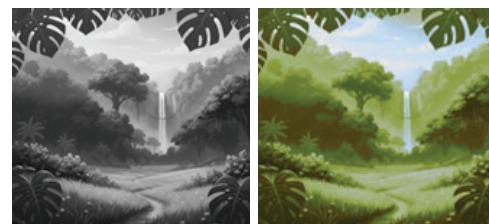
Figure 1. Examples images from the initial explanation to use GM (left - initial grayscale, right- after using GM in Adobe Photoshop version 26) (source: personal documentation)

Figure 2. The choice of images to be the base of the experiment (source: personal documentation)

Figure 3. Examples of finished works (source: personal documentation)

Exploration of Experience and Perception in Using Gradient Map for Digital Coloring

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

The results were analysed using the help of thematic analysis of Braun & Clarke (2006) via Ahmed, et al method (2025, p. 1) which consist of "familiarization with data, generating initial code, searching for themes, reviewing themes, defining and naming themes, and writing the report". This method is useful to provide a structured but flexible approach to analyse the dataset, especially with the experience, perception, and opinions (Mc Leod, 2024).

Result

The interview data were translated to English and reviewed to see the comparison and experience in both methods. The study tries to seek some patterns in the experience mentioned by the participants in the research. The results are later compared with the media and literature review.

Preferences and Perceived Usefulness between Gradient Map and Direct Color

The participants were asked to choose which of the methods they prefer after their experience. Between the direct color method and gradient map method, nine people (47,4%) chose direct coloring (DC) and ten people (52,6%) chose the gradient map (GM) method. But, when asked about their perception whether the GM makes digital painting easier, 16 respondents (84,2%) agree and 3 respondents (15,8%) disagree. This result may show that even though they have their personal preference in using the method in their works, gradient map was perceived as useful for working in general. Then, participants are asked about the reason for preference. The result is shown in table 1.

Table 1. Reason to choose DC or GM

DC Group

Speed and Efficiency
Direct coloring is a faster and more efficient process because they do not need to analyze the value and create an underpainting first.

"I chose direct color because I think it is faster, no need to analyse which part should be darker or lighter and no need to make black and white drawing first. I can do it faster and more accurately with this." (RZ)

Familiarity, Control, and Simplicity
Some users mention that they feel more familiar with direct coloring and that it is easier to master. DC also allows them to directly control their color and contrast, making it clearer, consistent, and simpler.

"I chose direct color because I have more experience with them, and for me, it took more time to learn gradient maps until I could do it well." (HJ)

Technicality and Suitability
GM needs multiple steps while DC is more direct making it less technical. Some respondent comments that it will be easier to use DC for more complex color while GM will be better for simpler composition and that it will depend on what project they are working with

"Technically, coloring using direct colors feels more efficient because in terms of time management, there is only one process in this coloring stage. If you use the gradient map technique, there are two processes: coloring the black and white values and matching the colors, selecting colors and masking different parts of the image in one stage, so it takes more time." (ACS)

"For me, I find that gradient maps are more suitable for backgrounds or objects with less complex colors, while models such as characters or animals are better suited to manual coloring because they use complex colors. It might be suitable if the entire image uses colors that are not very varied." (SN)

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

GM Group

Speed and Efficiency

It is seen as more efficient especially if working with tight deadlines and simplifies the coloring process and quicker color changes. They also mention they can use it to explore various color changes faster and simplify their decision to choose color.

"Because with Gradient Map, everything becomes more efficient and suitable for fast needs, which is very relevant in today's fast-paced world. " (JPJT)

Control

Participants mention GM allows them to use consistent colors to make moods and temperature and ease of control on the shadow, midtones, and highlights.

The ability to control the color faster makes them able to try various styles and color combinations to make more harmonious colors. The effects can also be edited anytime without disturbing the original image.

"I chose black and white followed by Gradient Map because I think it's exciting to see the tone changes. When it's black and white, I can focus more on the shapes and contrast without being distracted by the original colors. Then, when I use Gradient Map, the result can look more vibrant or have a certain mood, depending on the colors I choose. So it feels like I can control the mood of the photo whenever and however I want. Additionally, I also understand better how colors and light can affect the final result of an image." (RCB)

Artistic skill Exercise

With multiple steps, GM is beneficial for user to sharpen their understanding of highlight and shadow. Also, it can be used to develop the artist's art style.

"I wanted to learn how to adjust the lighting and mood of an image through color. With Gradient Map, I can make black and white photos more interesting with different color tones. When I tried it, I found that this feature helped give the final result a more dramatic and artistic feel. In addition, I also gained a better understanding of how contrast and color can affect emotions in visuals." (MN)

While both groups mention speed and efficiency, the DC group mentions that they perceive DC as faster since it does not need to analyse and do multiple steps compared with the GM group. GM Group perceived the speed and efficiency as quicker color change setting and exploring the various color schemes. Some DC Group participants mention that yes, it will be more difficult to change color after they finish the composition. Three participants mention less experience in GM to make them choose DC, with one respondent mentioning the experience in both were around the same but they prefer to work directly with color.

Perceived Experience

Participants were also asked to rate their experience from 1-6 with 6 as the easiest, fastest, and positive experience in learning curves, ease of use, speed, and satisfaction in both methods. The result is shown in table 2, figure 4, and figure 5.
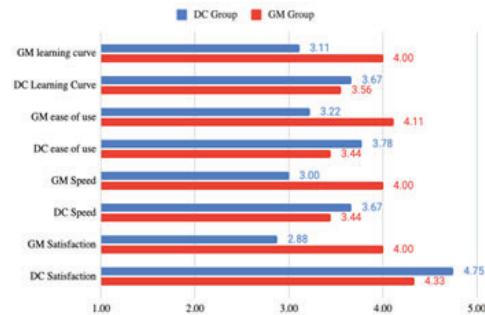

Figure 4. Average perceived experience comparison between DC and GM Group

In the group comparison result, on average, direct coloring group perceived DC as easier to learn, easier to use, faster, and more satisfying. Most significant differences were in satisfaction (1.88), followed by speed (0.56), with earning curves and ease of use having the same difference of 0.56 point.

Exploration of Experience and Perception in Using Gradient Map for Digital Coloring

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

In the gradient map group, they perceived using gradient map as easier to learn, easier to use, and faster, but using direct coloring was more satisfying. With the difference scores were ease of use (0.67), speed (0.56), learning curve (0.44), and last satisfaction (0.33).
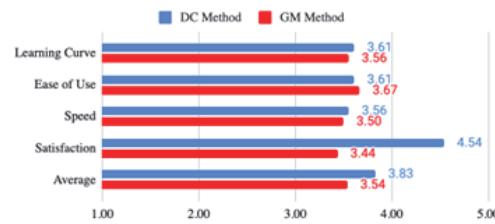

Figure 5. Average perceived experience in all participants

In all participants' average, in terms of learning curves, DC has a slightly higher average meaning it is perceived as has lower learning curves than GM. In Ease of use, GM has the lead, so GM is perceived as easier to use while working. For speed, DC is considered slightly faster. But for satisfaction, the data shows a much higher difference, with users perceived working with direct coloring giving them considerably more satisfaction. In summary, GM has a slight advantage only with ease of use and DC despite having a slight minority (10 versus 9) demonstrate more general advantages.

Table 2. Comparison between perceived learning curves, ease of use, speed, and satisfaction in both method
(source: personal documentation)

	DC Method	GM Method
Learning Curve	3.61	3.56
Ease of Use	3.61	3.67
Speed	3.56	3.50
Satisfaction	4.54	3.44
Average	3.83	3.54

Interestingly, participants show a higher average in direct coloring (DC) method in the overall average of perceived experience. Even in the question about which method they prefer to use, GM method has a slight advantage of 10 participants versus 9 participants.

Perceived Learning Curves

The majority of participants (17 out of 19) in both DC and GM Groups agree that learning gradient map will be useful for new learners. However, when asked about the perceived learning curves, the gradient map method averaged slightly less (3.56) than their direct color counterpart (3.61) as shown in table 2 and figure 4 meaning, gradient map is perceived slightly more difficult than direct color to learn. Participants also asked about their difficulties in learning gradient map, shown in table 3.

Table 3. Difficulties in learning GM
(source: personal documentation)

DC Group

Color Combination and Balance
Participants mention the difficulty in choosing color combination and balance in the setting. They find it difficult the find the perfect balance for their artworks.

Technical related with the GM Setting
Color stop in the gradient map setting bar, the right location for the right color position, and how the color transition smoothly in the gradient.

Early stage of Learning
They feel they are not familiar yet or in their early stage of learning gradient map. These reasons also affect their time management and confusion with the technical skill. One participant mentions their difficulties in timing their greyscale layer.

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

GM Group

Color Combination and Balance
In terms of color combination, participants feel it is hard to translate the color to the artwork, the balance and the color combination. Especially when the artwork is a complex one.

Gradient Map Concept
Similar to the early stage of learning, but GM group mention mostly about the concept early on and how the color is not what they expect with the gradient map setting bar mentioned by one of the participants.

Working with value
First step before the gradient map, the value drawings were mentioned, especially on how to make the value balanced before working on the color.

In the direct color group, the difficulty primarily lies in the control over the color, related with how the gradient map bar setting works. So it feels harder for them to produce their intended color combination. While gradient map groups mention their difficulties in the overall understanding on how gradient map works, and its implementation to a more complex artwork. So their process was more like an experiment rather than a precise process.

On the positive side, participants mention that gradient map users can also train their value sensitivity and focus while learning, expanding their knowledge in the software features, and make it easier and faster to set up and experiment with color in their composition. But they also noted that users need an understanding of layer, value, and color theory beforehand for effective use and to avoid flatness in the color.

Discrepancy between preference and usefulness of Gradient Map

Based on the result, it is found that there is a discrepancy between the preference of the slight majority (52,6% versus 47,4%), but the majority of the users (84,2%) agreed that GM is useful. While the idea of gradient map and its usage is perceived as useful for the user, it is possible that experiencing it on a digital coloring process might not be perceived as better for them. As indicated by the lower metrics in learning curves, speed, and satisfaction for the GM.

This result, can also be related to its advantages as the adjustment layer for their paintings or designs, with a non-destructive editing, color experimentation, and speed appeal in terms of editing but not in overall coloring process. Because the overall coloring process requires the user to perform multiple steps and have prior knowledge in value, the participants may feel that GM is useful, but not necessarily their chosen coloring method.

Using Gradient Map in Future Projects

Across the interview, participants were also asked about the future use of gradient map in their project. In direct color group (DC Group) participants mention they will be likely to use again because it will be an easier, having a fast and accurate color choosing, especially if the composition is simpler or having less color, but they mention it will depend on the project's needs, if it is more nuanced with specific and consistent color, then maybe they will use it or not use it at all.

Gradient map group (GM Group) also mentioned they are likely to use it again with more positive attitude, citing that it will be beneficial to create a more accurate and specific mood or themes and easily adjusting it and working with it on a tight deadline. They also mention the possibility to use it not only in digital

Exploration of Experience and Perception in Using Gradient Map for Digital Coloring

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

painting or coloring but also various projects like photography, character design, or any other digital artworks. But a minority of participants mention as not yet or only use it minimally since they are not sure on what project they will use it or only using it if they have a tight schedule.

Discussion

This study explores the experience and perception of learning curves, ease of use, speed, and satisfaction in both methods. The results are drawn from the experience of participants in doing experiments in direct coloring and gradient map and the comparison between their choice of method.

In exploring the use of gradient map in Adobe Photoshop in participants, the preferences are nearly split equally with 52,6% favoring gradient map method and 47,4% favoring direct color method. The participants majority agree (84,2%) agree that gradient map will be useful for the digital painting process. The direct color method demonstrated a slightly higher average across learning curve and speed, along with a considerably greater difference in user satisfaction. In contrast, the gradient map method's average ratings were only marginally better for ease of use. Implying that the gradient map method is easier to use but harder to learn, will take more time, and make them less satisfied.

First, in ease of use, gradient map's consistency of color, efficiency, and speed for specific cases like deadlines and the feature of non-destructive editing can give users easier time when editing composition and explore the color balance and moods. These ideas are in line with Santos (2020), Mohrbacher (2025) and Williams (2023), about the ability to edit after without disturbing the original images and edit it to achieve desired color and atmosphere. This advantage may relate with

the eagerness to learn and explore more, as a feature they can use to learn more about design and make their design faster in the future. Likely, even though they see themself as less experienced in gradient mapping, user saw the potential for this feature.

Second, the perceived learning curve is slightly lower average for GM may result from their lack of experience in gradient mapping, and not yet having pre-existing understanding about value, layers, and colour theory aligned with Santos (2020) articles about learning and using the gradient maps in their works. This results also in line with Bucci (2018), as it is too technical and Heya (2025) also put this as they need to understand the color expression and layer setting first.

Third, perceived speed. Previously the source mentioned that gradient map can speed up work by helping with colour combination and mood by allowing the color change faster (Nichols, 2024; Brunet, 2022; Huckleberry Art Academy, 2024; Mohrbacher, 2025). In the result, the idea of speed in gradient map is one of the main positive experience, but from the perceived experience, we can conclude that even though they see the gradient map process itself as a fast process, while working with it in the whole composition, it can be slower since they need to do more than just gradient map and need a pre-existing knowledge about the grayscale value like mentioned by Gardner (2024) about user can take longer time due to the focus on the value and its visuals to make it "look right".

Fourth, satisfaction can be very subjective for users and they can experience disconnectedness, lack of expression, and fun (Bucci, 2018). Lower scores in average perceived satisfaction may be related with the multiple steps they need to do before working with color. After working with value, the very technical gradi-

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

*Exploration of Experience and
Perception in Using Gradient Map for
Digital Coloring*

ent map setting, they also need to work with the masking process, making it feels more difficult to put intended color in the composition. Coloring with a gradient bar setting and cannot directly sure how to control the outcome may be related with feeling disconnected and lack of expression. Compared with direct color techniques that allow them to put intended color directly into the position and perceived as simpler and all in one process. DC is also closer to mimicking experience in learning direct color in the traditional sense with pigment and paper, making this more familiar with their previous experience and satisfaction when finishing the artwork, making it more expressive and connected.

Gradient map as a tool for learning

The Gradient Map method, which shares a conceptual basis with traditional underpainting (Gardner, 2024), was proposed as a tool to help the learning curve for digital artwork. This approach, however, is not a complete learning solution. The method's effectiveness is often obstructed by a user's own difficulties, such as a poor understanding of value, which can make the process more complex and inefficient. Nevertheless, gradient map can excel as a supplemental feature to help users to learn value expression and depth. The speed and flexibility of editing can also encourage users to experiment with different color schemes, which in turn deepens their comprehension of digital color.

Limitation and Future study

This study try to explore and provide insight about the experience in learning and using gradient map color method in digital coloring. However this research is limited by a small scope of samples with various experience and backgrounds. The software and hardware used is limited to

Adobe Photoshop and drawing tablet in Windows operating system. There is also limited time in the experiment, different time duration might also affect participants' experience. This can lead to a very niche summary and experience, since the majority of the participants are still learning and not a professional digital artist. Additionally, this study mainly focuses on the qualitative perspective and description, and the scale of the user's perceived experience is not analysed with a quantitative measurement.

For future study, a larger pool of participants with various backgrounds will be beneficial to deepen the study study about satisfaction and and more quantitative approach to the usability tests for the overall feature of the user experience and user interface since interface often are crucial to fill in the gap between physical and digital world (Kennedy, 2024). Based on the result from this research, it will also be interesting to study gradient map as part of a larger study about coloring in digital artworks.

Conclusion

In conclusion, this study explores the experience for learners and artists of digital art to learn and use gradient map (GM) in coloring their art and comparing it with direct coloring methods. And put it into two core questions.

About the learner's experience in working with GM to colorize and experiment, 89,4% (17 participants) agreed that it is useful for learners and 84,2% (16 people) agreed that gradient map is useful for digital artwork. The research also found that it is perceived as efficient and flexible since it can add and edit color fastly, but it can be considered as too technical for some who have less experience in value understanding and color theory. The process of gradient map itself is a fast, but

Exploration of Experience and Perception in Using Gradient Map for Digital Coloring

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

not the whole process of making the art. On the other hand, they found the benefit of using it as a tool to sharpen their value sensitivity and expanding their software knowledge.

In their experience compared with using direct color, the preferences are split near evenly with 52,6% (10 versus 9 people). But in the perceived experience, gradient map is only slightly better in ease of use, might be due to its advantages in editing color process. Whereas direct color is slightly better in perceived speed, and learning curve due to having only one step and need less pre-existing knowledge. And having significantly higher satisfaction because users feel more in-control and more connected.

Gradient maps can serve as a fast and powerful tool to edit color, mood, and atmosphere from a greyscale artwork. While it will be better for new user of gradient map to have an understanding about color theory and value difference in artwork, gradient map can serve as a tool to deepen their learning of value expression, encourage to learn and experiment with various color style, and technical aspect of the digital drawing software, thus maximizing its benefit as a productivity and experimental feature than only a coloring tools.

References

21 Draw, Calicó, F., Cofrancesco, A., Grigolo, G., Grünewald, S., Kikuchi, L., Wiseman, E., & Zhang, X. (2023). Mastering digital drawing : learning from the pros. 21 Solutions AB.

Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., M. Ameen, B. M., & Khdhir, R. M. (2025). Using thematic analysis in qualitative research. Journal of Medicine, Surgery, and Public Health, 6, 100198. https://doi.org/10.1016/j.glmedi.2025.100198

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Brunet, M. (2022, July 2). My secret coloring method with GRADIENT MAPS. Youtube. https://www.youtube.com/watch?v=eDB-25rweM8&list=TLGG-SWNgc4E_qQwwMTExMjAyNQ

Brunet, M. (2023, April 13). The fastest way to color your drawings. Youtube; Youtube. https://www.youtube.com/watch?v=88RfsiJoPlA

Bucci, M. (2018, December 1). Grayscale To Color Art Process … and why I don't use it. Youtube. https://www.youtube.com/watch?v=lJitss58XKc

Dovetail Editorial Team, & Kaluza, J. (2023, February 14). What is within-subjects study design? Dovetail.Com. https://dovetail.com/research/within-subjects-design/

Gardner, W. (2024, July 26). Give Your Colors Depth EASILY with Underpainting! Youtube. https://www.youtube.com/watch?v=4NW2GQ4TNZ4

HEYA ART. (2025, August 2). How to Glaze Colors Without Making Them Cloudy by HEYA - Make better art | CLIP STUDIO TIPS. Clip-Studio.Com. https://tips.clip-studio.com/en-us/articles/11122

Hibit, E. (2022). Color Theory for Dummies. John Wiley & Sons.

Huckleberry Art Acedemy. (2024). Automatic Color with Gradient Maps! (Photoshop, Clip Studio Paint, Krita, Affinity Photo). Youtube. https://www.youtube.com/watch?v=6bY-5i24wSYU

Kennedy, K. R. (2024). Introduction to Digital Art: Basics of Art & Design with Adobe Creative Cloud (K. Smith,

Elizabeth Jessica Sentani[1]
Min-Hyuk, Yoo[2]
Laura Gebrimova Kolombuto[3]
Eunike Yolanda Zefanya Sitinjak[4]
Abigail Tamba Siahaan[5]
Giovani Susanto[6]

Ed.). Lemoore College Open Educational Resource (OER).

McLeod, S. (2024, December 6). Can thematic analysis be used for questionnaires? Simply Psychology. Org. https://www.simplypsychology.org/can-thematic-analysis-be-used-for-questionnaires.html

Mohrbacher, P. (2025, March 13). GRADIENT MAPS for adding color?! (you'll never recover) - YouTube. Youtube. https://www.youtube.com/watch?v=xmYkXNkv2GE

Nichols, S. (2024, April 5). My full digital painting process: brushes, gradient maps, and more. Youtube. https://www.youtube.com/watch?v=F-P_2UMWS-dE

Sani, A., Watie, E. D. S., Aisyah, S., Suhendra, S., Ramadhanti, D., Juansa, A., & Rianty, E. (2025). Kreativitas Dalam Multimedia. Star Digital Publishing. https://books.google.co.id/books?id=PNVnEQAAQBAJ

Santos, D. dos. (2020, April 2). How to Use Gradient Maps | Muddy Colors. Muddycolors.Com. https://www.muddycolors.com/2020/04/how-to-use-gradient-maps/

Yin, S. (2022). Analysis on the Inner Relationship between Computer Digital Painting and Traditional Painting. Mobile Information Systems, 2022. https://doi.org/10.1155/2022/9462510