Colour Grading Video Files in Adobe Lightroom

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ABSTRACT

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The purpose of this thesis was to instruct the reader how to colour grade video files in a way that would be best suitable for photographers.

This thesis suggests why video content should be colour graded in order to make an impact on the viewer and stand out in a meaningful way. I go through the very basics of colour theory to help the reader better understand the emotional impact of colour when observed. Colour theory sets the base for all colour grading and correction related work.

Colour grading is an important step in high end movie and television production, but also in smaller productions, such as web-intended video publishing. It can help enhance the viewers' experience and to deliver certain moods or messages to the viewers.

In the empirical study of this thesis I will explain the work process of how to colour grade video files in Adobe Lightroom by going through my thesis project, which is two short videos made for Tampere University of Applied Sciences as an example of the workflow and work process.

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CONTENTS

ABBREVIATIONS AND TERMS

TAMK   Tampere University of Applied Sciences

DSLR   A digital single-lens camera, often referred as SLR or DSLR,
                              which combines a digital imaging sensor with a single-lens
                              reflex camera, as opposed to a film camera. The light travels
                              through the lens, then to a mirror that sends it to either the
                              viewfinder or the digital imagining sensor. These cameras
                              can often be used to shoot video files, depending on the
                              model qualities.

Digital container format   A metafile format, capable of containing various form of
                              data in computers, which describes how various elements of
                              data and metadata coexist on a computer file.

QuickTime (MOV)   Multimedia framework produced by Apple Inc., capable of
                              handling various formats of digital video (indicated as MOV
                              file), picture, sound and other interactive media.

MPEG-4 (MP4)   A method of compressing audio-visual data, created by the
                              international Moving Picture Experts Group. It includes com-
                              pression of audio-visual data for web, CD distribution, voice
                              and broadcast television.

Material eXchange
Format (MXF)   A container format for professional digital video and audio
                              media, which is usually used to deliver advertisement to TV
                              stations.

Audio Video
Interleave (AVI)   Multimedia container format, developed by Microsoft. it can
                              contain both audio and video data, which can be played in
                              synchronized audio-with-video playback.

DPX   A common file format for the digitalization of a motion picture that has been captured on film.

H.264   A video compensation standard, designed to provide good video quality at a lower bit rates than the previous standards.

Colour hue   One of the main properties of a colour, which indicates the location of the colour in the spectrum of coloured light visible to the human eye.

Colour model   A mathematical way of describing colours as tuples of numbers.

Colour space   The resulting set of colours that have been optimized for viewing conditions. It describes human colour vision and the way how monitors and screens work.

Due to their similarity, I have chosen to use colour space and colour model as separate terms to avoid confusion.

RGB   An additive colour model, as the initials indicate red, green and blue light, that are added together to reproduce various colours. This colour model is a device-dependent way of representing colours in electronic systems, such as monitors and displays. Before digital use, it was based on the theory of the colour perception in humans.

CMYK   A subtractive colour model, used in colour printing and to describe the printing process. The initials are based on cyan, magenta, yellow and black (k from the last letter, since b already indicates blue).

1 INTRODUCTION

According to the Interactive Advertising Bureau – a global non-profit organization that conducts research on marketing trends and advertising, develops industry standards and offers legal support - growth in video marketing is the biggest in any digital advertising markets. (2015) This means growing demand for video material and therefore people working in digital marketing areas need to adapt by updating their skills in order to work with these marketing trends. In this thesis I will first go through the future of photography as a profession, along with current digital marketing trends, moving on to colour theory and Adobe Lightroom as a colour grading tool.

As a photographer, enhancing colour and contrast in photographs is somewhat an everyday experience so naturally, it follows the photographer into working with moving image. According to my experience, transitioning into working with video content is easier when you know the basics of how to edit and enhance colours in digital photography. However, not many instructions or tutorials for photographers transitioning to video work exist. In order to create a tutorial, I have interviewed other photographers transitioning to video work and included my findings in the thesis.

I will also go through some of the basics of colour theory and explain why colour grading matters. In humans, emotional response to colour is a work of evolution and it is present in our everyday lives. Colour theory helps us to understand the emotional impacts of colour and to enhance them in an effective way. Colour grading is used to deliver messages, to set different moods and to make the content look better overall. To make this topic more relevant to photographers, I have limited the colour theory discussion in this thesis to focus on the aesthetical principles of colour, rather than using the emotional responses and symbolism of different colours, which is more commonly used in film and television production. According to my interviews, many photographers are keen on sustaining their personal styles when it comes to photography, so naturally when working with new media, these styles are applied to it.

The instructions I have created are intended and recommended to be used in smaller productions, such as marketing video content for social media and digital publishing, to make the video content more appealing to viewers on mobile and tablet devices for example. Lastly, I will present my colour grading workflow and results of my thesis project, which

I have used for empirical studies. I have produced two short videos, "International Week After movie" and "Seili Behind the Scenes" for Tampere University of Applied Sciences. I will use these as an example of how to colour grade video files in an easy and effective way.

2   FUTURE OF PHOTOGRAPHY

2.1   An outlook on the future of photography jobs

It has been estimated by United States Labour Statistics (2015) that photographers will face competition in their job market, as the overall growth of the industry is limited due cheaper gear and increasing number of hobbyists. Nowadays valuable assets as an employed photographer are post processing related talents, such as video editing capabilities. These assets are on demand due to the rise of video consumption.

2.1.1 Differences between digital photography and digital cinematography

According to photographer, filmmaker and wildlife biologist Chris Gamel, transitioning from photography to filmmaking is relatively easy, because photographers possess the ability to create beautiful, captivating images, and because of the photography related skills, such as lightning and composition can be directly applied to filmmaking. He pinpoints the fundamental differences between photography and videography to be motion, sound and narrative. (Gamel, C. 2011.)

A photographer transitioning to video must also consider the technical differences between the tools used in both digital photography and digital cinematography, most importantly existing in digital video formats.

There are many different video formats, some of which are optimized for capturing video, some for editing video. The main difference between video output in professional digital video cameras and DSLR cameras is the file size and compression. DSLR cameras are primarily intended to be used in capturing images, therefore they have less controls for filmmaking.

DSLR cameras record video through an image processing unit, which compresses video files, thus limiting file size, colour space and editing abilities. These video files are generally in formats such as QuickTime (MOV), MPEG-4 (MOV/MP4), Material eXchange Format (MXF) and Audio Video Interleave (AVI).

Professional digital video cameras shoot raw files, which are technically not video, but raw image data files from an image sensor, that are unprocessed and have to be processed into video files in post-production, along with other unprocessed video files. This allows more adjustment in exposure and colours but leads to bigger file sizes.

As this thesis suggests, colour grading is an important tool in editing digital video, therefore a photographer must ensure the editing abilities in their video files. DSLR cameras can offer high quality video files that can be easily edited and colour graded, but the settings are baked-in. This means that the DSLR camera, differing from the professional digital video cameras, is applying settings, such as white balance and picture control, in a non-raw format, which cannot be adjusted later. This means that the photographer has to get familiar with these settings - which are also used in photography - beforehand, so they can be adjusted prior to shooting video.

2.2   Rising demand for video content

As the studies by Interactive Advertisement Bureau (2015) suggest, the growing trend for video format in marketing and video viewing in smartphones is rising and thus beating the web browsers used in desktop computers. This creates more demand for the digital advertising industry to produce video content for smaller screens. This content can be DSLR video, combined together with infographics and other visual elements. Studies by Adobe Digital Index (2013) suggest that mobile viewing on smartphones has tripled every year since 2011 and keeps growing with a steady pace. As seen in Figure 1, the growth in mobile video viewing has tripled from 2011 to 2012.
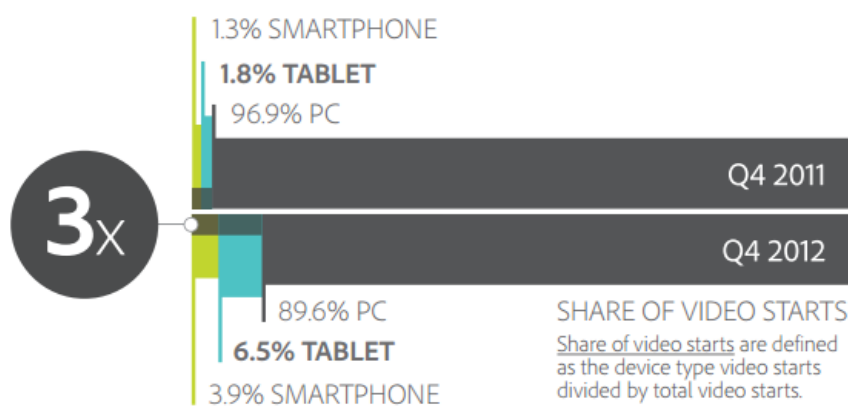

Figure 1: Graphic showing the growth in the mobile video viewing with smartphones and tablet devices. (Adobe Digital Index.)

2.2.1 Visual storytelling

Many economical publications, such as Smart Insights, have published expert authors' articles on marketing and new trends. In 2016, due to rising demand for video content in marketing (Interactive Advertisement Bureau 2015), visual storytelling is a key factor in video marketing trends.

According to Larry Alton's article in Smart Insights, visual storytelling appeals, when used in marketing, to our need to engage with other people through different stories. It creates visual narratives out of graphics, images, videos, statistics and infographics. These narratives can be used to help create emotions and to suggest certain desired actions in different target groups. In terms of marketing it means portraying brands' messages. (Alton, L. 2015.)

2.2.2 The Future of Digital Media Publishing

In recent years, digital media publishers have enjoyed growth in their readership (Adobe Digital Index, 2013). Slowly, these publishers have started to move towards televised broadcasts, where they reach a wider audience. Traditionally, television production involves more planning with further steps and longer production than producing video-only web content, whereas video-only digital marketing is nimbler, having only a few steps in its process, seen in Figure 8 on page 19 of this thesis.

3 COLOUR THEORY

3.1 Colour perception

First determined by the physicist James Clerk Maxwell in 1872, the human eye is capable of distinguishing colour by responding to three different stimuli, that are in fact three different pigments in the cones of the retina, that are sensitive to red green and blue. This discovery has set the basis of recording and displaying colour, but also fundamentality that all visible colours are created by mixing these three colours. This so-called tristimulus response is very closely related to the way in which digital cameras and monitors work. (Freeman, M. 2005.)

The three primary pigments together with different amounts of light and a detector – an interaction between our eyes and brain - create all colours visible to the human eye. (Fowler, J., Hullfish, S. 2009.)

As seen in the illustration below, the rods and cones are the receptors in the human eye, which allows us to pick up colour and light. Each cone contains pigments sensitive for either green, red or blue, therefore detecting colour by absorbing different wavelengths of colour. Rods are more sensitive than cones, but they detect light in black, white and in different shades of grey.
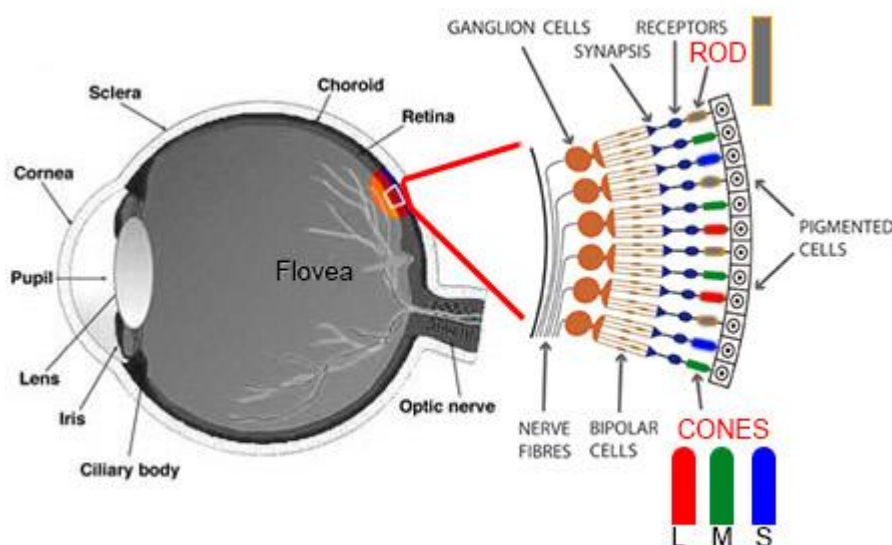
Figure 2: The basic physiology of the human eye, with photoreceptor cells, cones and rods visible. (Dreamwallsglass.com)

For one to use colour in the correct and effective way, it is important to understand that colours do not appear as they seem, but they deceive our vision. The abilities to perceive colours vary a lot, but they can be trained by practical exercises, even though our response to colour depends on physical, physiological and psychological components mixed together. The brain processes this experience involving our own associations and emotions towards different colours. (Albers, J. 2013)

The usage of colours and colour aesthetic has traditionally been painters', visual designers and illustrators' practises throughout the history of visual arts, but in order to skilfully create powerful colour relationships and colour effects as a photographer, for example, must study colour theory in order to gain the means to it.

3.1.1 Colour and sensation

Humans have natural associations when sensing colour and physical sensation, the strongest being the association between temperature and colour, but contrast between day/night and wet/dry are also powerful associations. For example, heat and things that glow with heat are associated with the colour orange, or something close to it on the sensory colour poles. (Freeman, M, 2005.)

3.2 Primary hues

Hue is the basic characteristic of a colour and there is an infinite number of possible hues, but a full range of hues exist between two hues, for example, in between red and yellow exist all the orange hues. (Adamson, J.C. 1997)
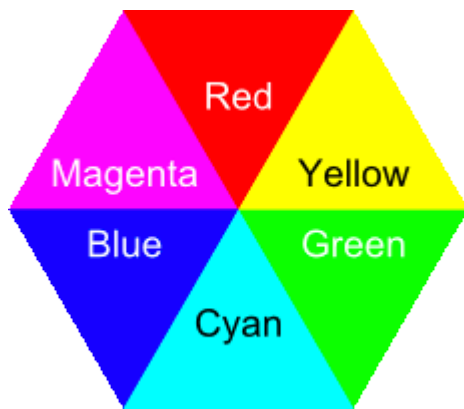
Figure 3: The six primary hues. (Adamson, J. C.)

These primary hues from Figure 3 are the basic components of additive and subtractive colours which allow different mixtures of colours. These methods are covered in the next chapter of this thesis.

3.2.1 Colour models

Colour models are mathematical and abstract ways to describe how colours are represented in typically three or four components of different values.

A subtractive colour model means colours that begin with white and end with black: when adding colour with ink, dye, paints or pigments, the result gets darker and when printed on paper, the colours absorb light. These colour models are CMYK and the 4 colour process and they are used in print work. As the amount of ink is increased, the eye receives less reflected light from the paper and therefore perceives darker tones. Every mixture increases luminosity of the colour. Due to the varying quality of the paper used in printing, the colour model alone is not sufficient to achieve the desired tone of black, so therefore a specific type of black ink must be used in the CYMK printing process. As seen in the Figure 4, the centre of the colour model should be black, but varying on the monitor and paper this thesis is viewed on, it may seem lighter and does not necessarily appear in the right shade of black.

The modern scientific colour theory suggests the usage of magenta, yellow and cyan as the most effective three colours to combine for the widest range of colours with high surface strength. Red is produced by mixing magenta and yellow, blue by cyan and magenta, and green by yellow and cyan. (Gurney, J. 2010)
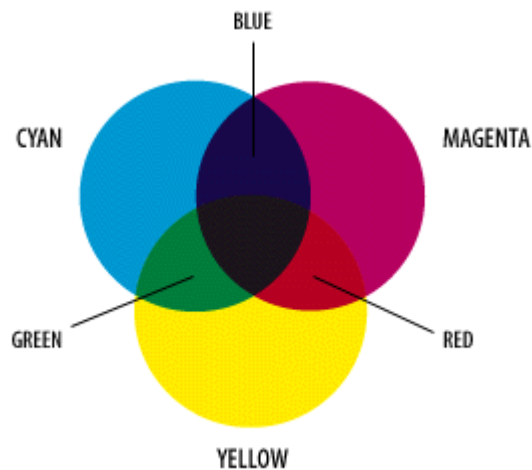
Figure 4. The CMYK colour model. These are subtractive colours. (Adobe.com)

Conversely, additive colour models begin with black and end in white: when light sources of different wavelengths are added it creates colour. These colour models are used in monitors and screens as RGB colour space. (Malpas, P.)
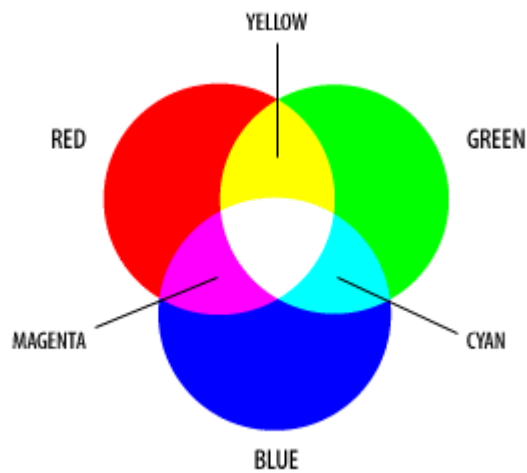

Figure 5: The RGB colour model, which also describes the RGB colour space in monitors. These are additive colours., (Adobe.com)

Nowadays, different colour models can be found online for digital use, such as web design, graphic design or other colour sensitive visual design.

3.2.2 Colour space and management

The colour space is often a three-dimensional model that is used to represent a specific organization of colours, both analogically and digitally. A colour management system (CMS) is a software tool collection designed to ensure colour consistency from different devices to printing process. colour profile is used to indicate a device's colour space, for example, a digital camera.

A colour space and its coverage is also called a gamut. It represents all the colours that a monitor or a camera is able to display, for example sRGB and Adobe RGB, which are industrial standards and not device dependent. They are used to ensure that colours stay the same from one device to another, for example, from a camera to a computer, and eventually to a printer. Many colour models would be capable of producing a limitless gamut of colours, but corresponding colour spaces often limit parameters to a certain range. Colour management is most beneficial when used in devices that hold a low amount of gamut, such as different printers. (Adobe.com) These colour spaces vary from each other, sRGB has a narrow gamut and Adobe RGB has a wider gamut, as Adobe RGB is designed for colour sensitive work for professional use.

3.3 Colour aesthetics and harmony

Even though perceiving colour is highly individual, there has been a number studies about colour harmony, some indicate that harmony exists when colour hue similarity increases, others indicate vice versa. However, it has been recently suggested that colour harmony increases when hue similarity increases. (Schloss, K. E, Palmer, S. E. 2010)

The main principle in all colour theories is that the eye and brain find colour harmony and satisfaction in neutrality only. The most pleasing colour pairings can be found when using the complementary colours in relative brightness of pure colours. Complementary colours are colours that when combined, neutralize each other, creating grey or black tones. These grey tones do not have to be present, only the colours that would create grey

tones when combined. Each colour has its own intrinsic brightness so in order to achieve balance, these combinations should be used in certain proportions.

Any two colours that are opposites of each other create harmony. These theories may generally work, but it is not safe to implicate that all images should be harmonious. Together with the opposite of harmonious, discord, they play their part in art and photography. A graph that shows complementary colours across a circle can be used to explain these colour relationships.
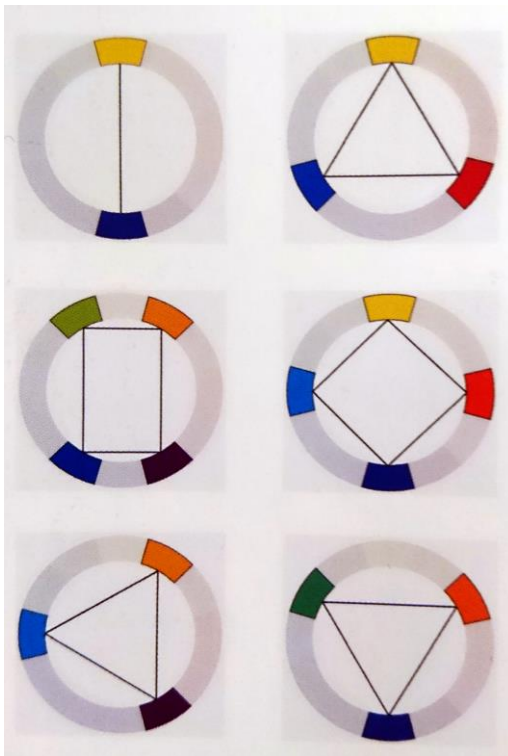
Figure 6: Complementary colours across the circle, forming harmonious colour relationships. (Freeman, M.)

According to Freeman, in his book Digital Photography Expert: Color, the base-line of colour harmony is only a foundation. When used precisely it might become predictable, uninteresting and lack innovation. Colour harmony can be used to make an image look emotionally impactful, but not all pictures need to generate these impacts.

3.4 Colour balance

White balance is a camera setting for changing the colour balance in photographs, making it warmer or cooler, based on the type of light a photographer is shooting in. Our naked eye adapts to the colour temperature of light very quickly by chromatic adaption, but cameras lack the processing skills our eyesight has. Digital cameras adapt to these changes by white balance settings, their goal being in rendering the colours – especially neutral colours – correctly. This process is equivalent to colour grading when applied to video work. Colour balance and colour grading can also be changed deliberately to create an effect with different styles.

Colour balance scale is based on colours emitted from a heated up object to various temperatures and is measured in kelvin (K). When heated beyond 1000K, a substance begins to emit very red light. More heating makes substances glow in whiter light, and at 5800K the colour is neutral white, eventually increasing in blue colour. (Freeman, M.)
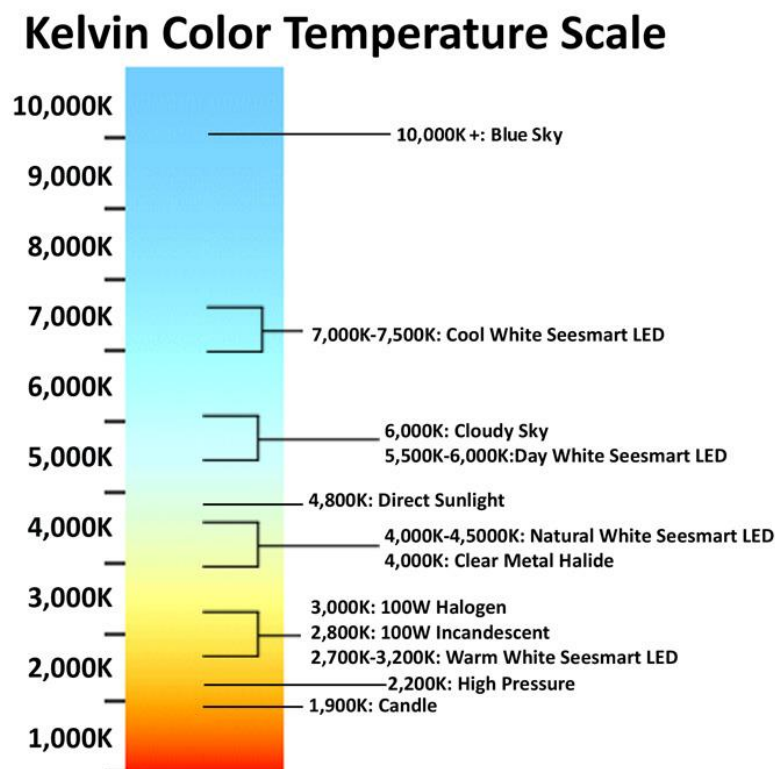

Figure 7: The Kelvin Colour Temperature Scale, showing temperatures of different light types. (Klingenberg, F.)

Colour balance has a part in our everyday lives. Whereas our eyes can adapt to chromatic changes quite quickly, device monitors and cameras do not always correct the distortion.

An example of this is a famous, badly lit photograph of a dress posted on social media, along with a plea for other social media users to help determine the colour of this dress. Depending on the person who looked at this photograph, some saw white and gold and others saw blue and black. Explanations emerged quickly on social media, suggesting that different colours in light can distort the image's white balance and create an illusion of the perceived colours. The mobile phone which the photograph was taken with most likely had automatic white balance settings, which over-exposed the photograph in an attempt to adjust the seen object more visible, resulting in white and gold colours.

Drawing 1: An illustration that explains the differences in perceiving a dress of certain colour, depending on the colour of the light and exposure. (imgur.com)

As the illustration above shows, white balance is changed by the colour of the light. The most relevant observation is how much variation different people saw in this image and how their perception allowed the colours to form.

4 COLOUR GRADING AND CORRECTION

4.1 What is colour grading?

Colour grading is an important tool in video production, partly equivalent to the process of colour balancing in photography. Together with different cuts and music it creates a unique experience to the viewer, enhancing different moods and atmospheres. Demand for colour graded video is rising, not only because of the rising demand for video content overall, but also because of the increasing quality of displays, such as in smartphones.
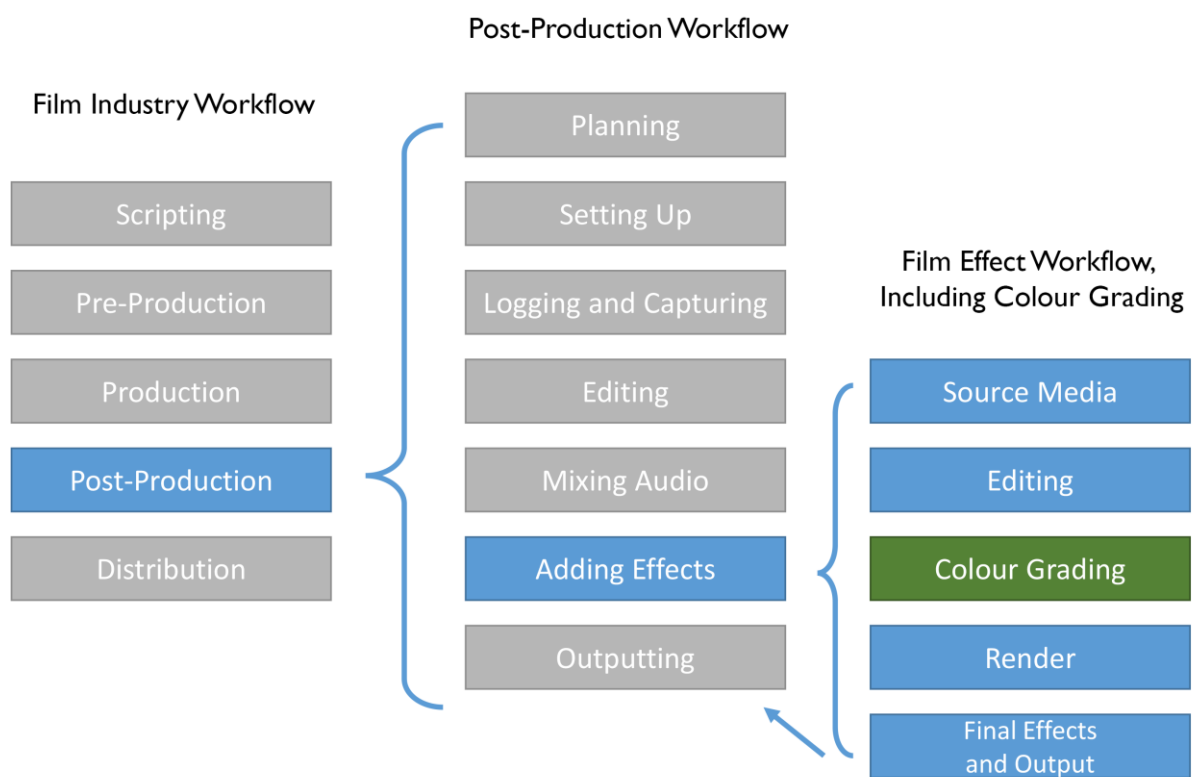

Figure 8: Flowchart of the typical film industry workflow, showing the different steps in filmmaking process, showing colour grading as a part of film effect workflow.

4.1.1   Why colour grading matters?

When shooting video and photos in digital form, the content is flat and not baked in, to allow for the full adjustment of values and colours. Flat is a professional term used in photography and videography to describe content that lacks colour and contrast. This flat content is not aesthetically pleasing, nor interesting, to watch and follow. Colour grading allows this content to be edited to appear similar to the natural and normal perception of the human vision, therefore appearing more inviting and interesting to the viewer.

Image 1 and 2: Stills from independent movie House on Pine Street, Image 1 above seen straight out of camera and shot flat on purpose with Histogram on the right, Image 2 below with Histogram on the right, colour graded by Taylre Jones, at Grade Kansas City. (fstoppers.com) Screenshots of Histograms from Adobe Photoshop by author.

The edited content shows dramatic difference to the original, flat content. The Histogram graphic in the right corner of both images shows significant changes in the colour channels and the tonal range, which indicate more vivid colours and adjusted brightness. This graph is also available as a tool in many photo and video editing softwares and will be covered further on pages 26 and 27.

4.1.2   Using colour theory in colour grading

Colour theory can be used in terms of user psychology to enhance viewers' experiences, by impacting the emotional responses provoked by colours. When applied to colour grading, it can be used to create more visually pleasing video content, for example by increasing contrast and saturation. The attention of the user can be guided by using different effects, such as vingette to darken or lighten the corners of the image, or to make a certain object to stand out by desaturating its' surroundings.

4.1.3   Delivering moods and messages

Colour grading is not only a tool for making your content simply look better, but also to deliver different moods and messages. The emotional response of colours creates different attributions and moods in the viewers. Different genres of films and TV series use different styles and colour symbolism to deliver these messages. For example, horror movies are usually dark toned, but make bright colours like blood red stand out to create a dramatic, scary atmosphere. Psychologist Robert Plutchik created an infographic in 1980 as a tool to understand his psychoevolutionary theory of emotion. This infographic can be applied when choosing different colours to deliver and set different moods for desired emotional effect. The interpretation of colours as triggers for different moods is of course very culture specific, so this graph may not be universally applicable.
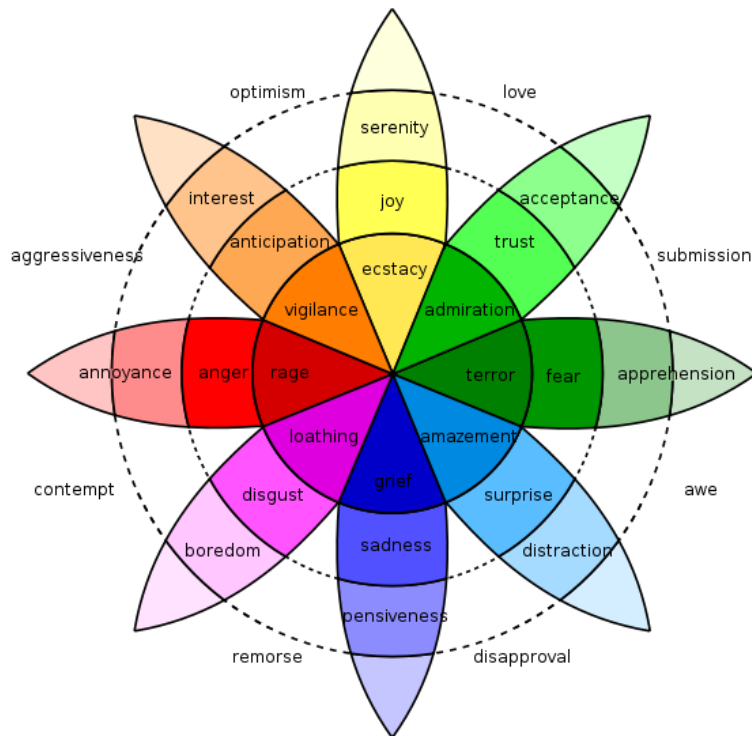
Figure 9. The Plutchik Colour Wheel of Emotion. (http://whatis.techtarget.com/)

4.2 Adobe Lightroom as a colour grading tool

I chose Adobe Lightroom as my primary colour grading and colour balancing tool, since it is designed for photographers to easily edit their photos in an efficient way. Adobe Lightroom is not primarily intended for colour grading video files and may not be the most effective way of colour grading your video content, but for photographers who are familiar with it, it offers a rather easy transition into working with video files, without having the need to learn how to use new software.

When I was searching for a working method most suitable for me, I interviewed a person who has also recently transitioned to working with moving image from still photography and has started to produce video content about their preferred workflow. We both struggled with the same issues when adapting to the new working method; we wanted to maintain our personal photography style when transitioning to video. It seems that colour grading video content is an important step in order to maintain the personal style and to create a visually pleasing result that is interesting to the viewers.

I think Lightroom is say, different from video-editing softwares, because a lot of what filmmaking is nowadays, is colour grading, adding blues and greens to make things more serious and dramatic, and I think that for a while at least, movies stopped looking like photographs and they had their own 'colour language' in a way. But with Lightroom what's great for someone's who's aesthetic is more centered on photography is that you can really easily give a look to your videos that is different from movies, that is more personal. In video-editing softwares you can change the colours too and make them similar to create an overall look, but the process is a lot faster in Lightroom and if you're well-organized and put together screenshots of videos with the same lighting, it can be done really quickly. It's also a great in-between app from the camera to an editing app, since it keeps a pretty thorough history of the edits you've done. Basically this is keeping your work consistent if you also take photos. It's a good way to stand out and have your own "look" that stays consistent, through the mood or atmosphere. (R. Tranquille, personal communication, November 18th 2016.)

This finding underlines the importance of colour grading, also from the photographers' point of view, where maintaining personal style and look is important, but to also consider the potential viewers' expectations and preferences.

Typically, when I use Adobe Lightroom as a colour balancing tool for photographs, it does not differ from the video colour grading workflow very much. However, Adobe Lightroom does not allow editing videos in the Develop module, which is an editing module for photographs. It consists of two sets of panels and a toolbar for viewing and editing a photo. It includes settings for colour adjustment, tone control, photo cropping, removing red eye and other local and global flaw corrections, along with adding or reducing grain and sharpening the photo.

Image 3: A portrait colour balanced with Adobe Lightroom, showing unedited material on the left and edited material on the right. Image by author.

Image 3 is an example of my typical edits of a photograph. I have increased contrast, simplified the colour palette by decreasing saturation in green tones, therefore creating a darker atmosphere to the background of the photo. I have increased the saturation of blue and magenta tones, making the subject more distinguishable from the background.

Unlike editing softwares intended for video editing, Adobe Lightroom does not include specific colour grading tools intended for video editing, such as chroma correction or colour scopes unlike Adobe Premiere has. However, like many other photo and video editing softwares, Adobe Lightroom has a Histogram, which shows when clipping occurs in your photos or videos, as partly explained on page 22. Clipping means a loss of detail when shadows are too dark or highlights are too bright. This feature helps the user determine where the clipping occurs and to adjust it accordingly. It is available to use in the Develop module, but also in the Quick Develop module for colour grading video.
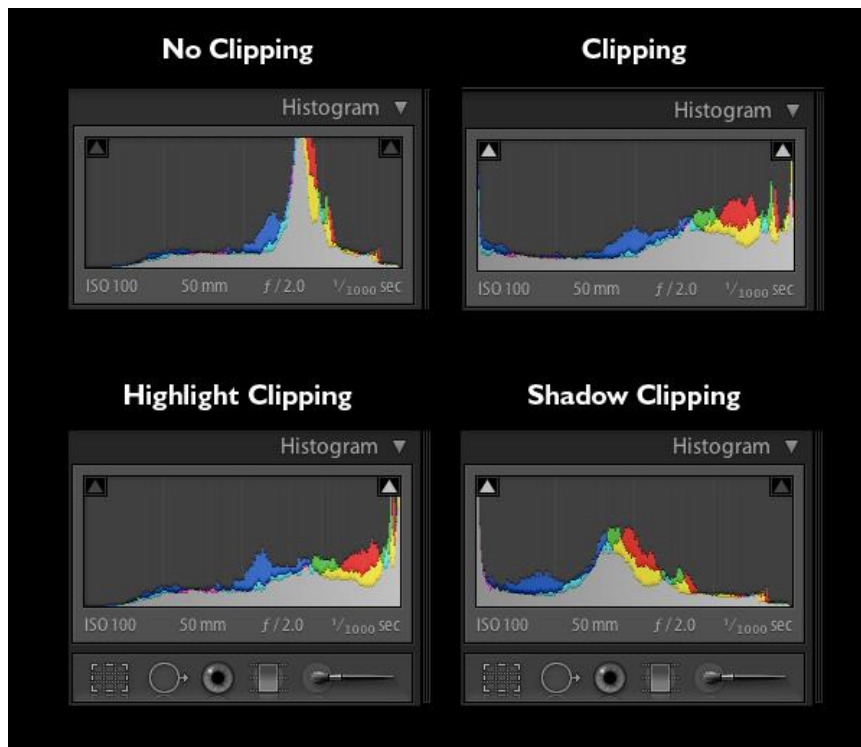
Figure 10: An example of Adobe Lightroom's Histogram showing various clipping with active white pointers on top of the Histrogram.(photography.tutsplus.com)

4.2.1 Colour grading video files: Workflow

Adobe Lightroom as a colour grading tool for video files is quite similar to editing photographs for example the changes done by the user are non-destructible, so all the editing can be undone by clicking the "Reset all" option.

Lightroom supports most of the DSLR camera video files, such as AVI, MOV, MP4 and AVCHD. Video files can be imported in the same way as photographs, but the Develop module is not supported for video files. However, the Quick Develop mode can be used in the Library mode, where some of the basic adjustments are available for video files, such as white balance, tone control, exposure and contrast. These are the very basic tools for editing colour and values and are also available in the Develop mode. The Library mode allows these basic edits, along with viewing, comparing, sorting and managing of photographs or video files, shown in the user's catalog. It is the home screen after importing photographs or video files into Lightroom.

The user can work their way around to edit videos in Develop mode as well, by capturing a frame from the video, editing it and then synchronizing the captured frame with the desired video clips, so the adjustments from the captured frame will be copied to the video files. This also allows the use of the Histogram, to erase all clipping in the exposure values, as explained previously.

Image 4: Adobe Lightroom Library workspace with imported video files. Histogram and Quick Develop module is seen on the right side of the screen. Image by author.
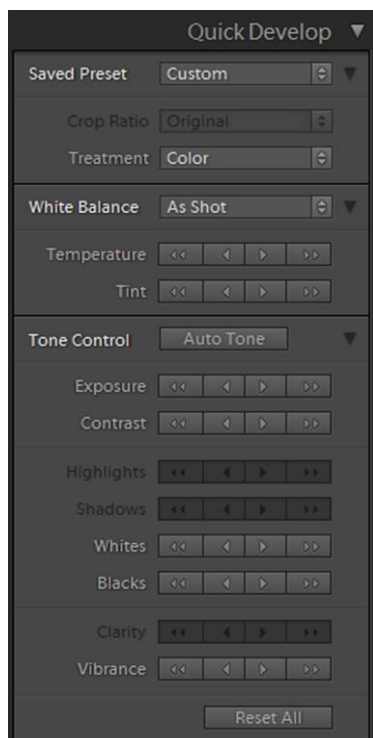

Image 5: Adobe Lightroom's Quick Develop module, showing which settings are available when editing video material. Image by author.

As seen in Image 4, the timeline, visible under the video file, allows the user to go through the selected file and to select the desired duration. The user can also select a new poster frame of a desired frame in the video by clicking the screen icon below the timeline. After the video has been graded, it can be exported much in the same way as photographs, by selecting desired output resolution and quality. These output formats are DPX, H.264 and the original, unedited file. (Adobe.com)

4.2.2   Presets

In Develop mode, Adobe Lightroom can be used to adjust image tone and exposure. These settings can be saved for later use and used as presets. Adobe provides some existing presets, including Lightroom Video Presets. Additionally, the user can create their own presets that are saved in Lightroom's own format for presets. This feature is available in a drop-down menu in the Quick Develop module the Library mode. The user can copy paste settings, including these preset settings to other imported images and videos, which makes the editing faster. (Adobe.com)

4.2.3   Adobe Photoshop vs. Adobe Lightroom vs. Adobe Premiere

I have chosen Adobe Lightroom as my primary tool for working with both videos and photographs. However, many of these editing capabilities can also be found in Adobe Photoshop. Several arguments can be found to support either program, but compared to Photoshop, Lightroom offers a more intuitive user interface that benefits the non-experienced users. (Harmer, J. 2015.)

Adobe Lightroom offers a full view of all the changes made by the user in the History panel, which means that the program remembers the user's changes to the files and all the changes to the original file can be undone.In addition to this, its workflow can be more efficient by allowing the user to work with their presets from photo-editing capalibities, to view the images in catalogs and grids, in addition to easy exporting and publishing multiple files.

However, the user can also keep track of the changes made to the original files in Photoshop as well, by using adjustment layers that can be deleted and therefore changes to the original file can be undone. The History panel in Photoshop does not save all of the

changes made by the user, unlike in Adobe Lightroom, which does not share the layer system, but the changes are fully available for the user to see in the History panel.

All of the same colour editing capabilities are also found in Adobe Premiere, which is a video editing software. For an experienced user, Adobe Premiere offers colour tools that can be used in an efficient and fast way, for example the Lumetri Colour panel, which includes white balancing, colour grading, different vingettes and a wide range of colours in a colour scope. For inexperienced users or for those who prefer minimalistic and simpler tools together with easy repetition of ready-made styles in both photographs and video files, Adobe Lightroom is an option for smoother transitioning to video work. Adobe Premiere also offers ways to save ready-made settings for colour grading, but with Lightroom the user can use their already made presets for editing their photographs and applying the same styles in their video.

The user must take note on the fact that when exporting video from Lightroom, it can only be exported with the colour graded settings in H.264 format, which compresses the file. After being exported from Premiere the file is compressed again, resulting in possible loss in image quality. This may not be a problem for videos that are intended to be published online or to be looked at on smaller screens, but is important for the user to remember if there is a need for colour graded material that is intended for bigger scale production or to be viewed in bigger screens.

5   THESIS PROJECT

5.1   Promotional videos for TAMK

As the thesis project I have completed two promotional videos for TAMK, both for different marketing purposes. My intention was to create videos that would be uploaded to social media, so the production was quite simple and only had a few steps, including shooting of the video material and editing the material into longer videos. When creating videos for web use, the requirements of the quality and duration are not as demanding as in film and television production. According to recent studies, video consumption on smartphones is on the rise and important key factors to video consumption are good image quality and free content (The Interactive Advertisement Bureau, 2015). Even though mobile and web content doesn't require as much production as film and television production, it is important to keep in mind how to make the video content more appealing for the viewers.

5.1.1   Goals

The goals of these videos is to promote the Degree Programme in Media and Art to potential applicants. With my videos I wanted to highlight the creative and fun environment on the campus, so I chose to colour grade my video content in order to enhance that mood and to create aesthetically pleasing video content.

5.1.2   International Week Aftermovie

My task as the International Week Aftermovie maker was to capture the most interesting workshops, musical performances and lectures on video. The purpose of the video is to market International Week as an interesting and relevant event, so colour grading, together with fast paced editing style, is a good option to create a mood of an energetic, lively event.

5.1.3   Seili Behind the Scenes

For quite a few years now, a group of students from the Degree Programme in Media and Arts have travelled to Turku Archipelago to spend a week on Seili Island. My task was to make a behind the scenes type of video to use as a marketing video for potential applicants of the Degree Programme, and to show what kind of possibilities there are in terms of working on projects during the week on the island. I wanted to capture the scenic beauty of the island and combine it with the laid back, relaxed feeling the students have when working together surrounded by beautiful nature, so I chose green tones together with higher contrast compared to the original file. (Image 6 on page 32.)

5.1.4   Workflow

My workflow consisted of shooting video material during the International Week event and during the week spent on the Seili Island, then colour grading the separate files and finally post producing the material into a longer video.

After shooting video with my DSLR camera, I went through the video files and selected the ones with the most usable content, in this case the best lightning, quality and low motion blur. I imported these video files to Adobe Lightroom, where I started colour grading them, one by one. My video files were short, lasting approximately a maximum of 20 seconds each, so that colour grading each scene would be easier as the lightning wouldn't change too drastically and make individual video files more difficult to handle.

As explained before on page 27 and 28, I used captured screens from video files to edit the whole video in Develop mode, to ensure best outcomes for the colour quality. In my own photography work, I have used the presets that Lightroom allows its user to create and use. These ready-made presets can be used to create more efficient workflow. When working with different photographs, I have become more familiar with how different presets work with certain type of lightning or colours, which makes colour grading video more intuitive for me. Colour grading can also be done manually by adjusting the colours and tones in Quick Develop.

After colour grading the video files separately, I imported them to Adobe Premiere to work the video material into the full video, with features that are not available in Lightroom, such as adding soundtrack, timing effects and transitions, which are visible in the Image 6 below, on the bottom of the screen, below the video preview.

Image 6: Adobe Premiere workspace. Image by author.

Color Grading Workflow in Adobe Lightroom & Adobe Premiere

Source Media

Color Grading in Adobe Lightroom

Manual Adjustments in Quick Develop

Capture Frame from Video File

Editing in Develop Module

Copy and Paste Settings to Individual Video Files

Export from Adobe Lightroom

Editing in Adobe Premiere

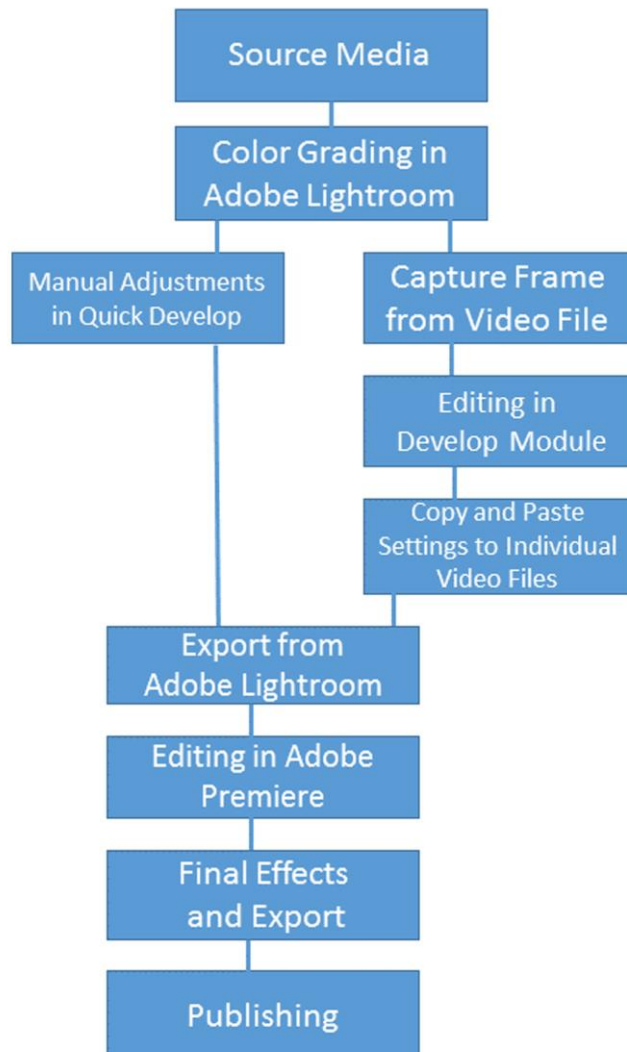Final Effects and Export

Publishing

Figure 11: My colour grading workflow in Adobe Lightroom.

5.2   Analysing results and thoughts

The videos that I have produced are now visually appealing, interesting to watch and look better by using the techniques I have described earlier. Most importantly, they showcase video content of the possible activities one can participate in while studying at Degree Programme in Media and Arts, in TAMK. By this example, these marketing videos also portray what a student is able to learn while attending this study programme, thus creating a powerful marketing tool. They also portray my personal style and aesthetic in photography.

Using Adobe Lightroom for colour grading video files has been an easier transition into working with video material, rather than using programmes intended for video work only, such as Adobe Premiere. Adobe Lightroom is more delicate in a way, foremost in its non-destructive editing capabilities, whereas Adobe Photoshop and Premiere do not allow this way of editing, in my own experience often resulting in a corrupted video file with changes that cannot be reversed, as explained on page 27.

Adobe Lightroom allows photographers who are already familiar with the programme develop their skills even further in an effective and uncomplicated way, ensuring their ability to compete in job markets in the future.

What I mostly learned from this process was the importance of enhancing colours. Even though a photographer works to create images that are visually appealing, the importance of other viewers than yourself as the creator is huge and should not be taken lightly. In terms of marketing and viewer experience, it is crucial to set your working methods to take note of the viewers and their needs first.

Image 7: Unedited material on the left, colour graded material on the right. Video frame with Adobe Lightroom Histograms from Seili Behind the Scenes. Image by author.

As seen in Image 7, imported video material from a DSLR camera looks flat, showing less contrast and desaturated colours, compared to the material after colour grading.

The colours in the colour graded video frame look more vivid and appealing, after adding contrast and adjusting tint. The Histogram shows the difference between the two frames' tonal range, indicating increased saturation and contrast.

The videos I have created are available on Youtube, behind these links:

https://youtu.be/2qzTNzVhXUI

https://youtu.be/TKKAbM5ogtc

6 DISCUSSION

This thesis validates and supports colour grading as an important tool in working with video files. There are many tools available for colour grading, varying in difficulty and usability to suit each user's personal needs. Adobe Lightroom is a software that offers a relatively easy transition to video work from photography and is a valid choice for those who are keen on maintaining personal style through their photography work to film making. As my discussion with other students transitioning to video from photography suggests colour grading is as important step in editing as setting colour balance in photographs is. For photographers already familiar with photography workflow, colour grading is a natural continuum with high importance in video workflow, rather than something that would come along later when more acquainted with moving image.

REFERENCES

Abramovich, G. 2014. 15 Mind Blowing Stats About Digital Publishing. Adobe CMO. Read 27.10.2016.
http://www.cmo.com/features/articles/2014/4/22/Mind_Blowing_Stats_Digital_Publishing.html#gs.Lh9jh1M

Adamson, J. C., 1997, 2012. The Muser, Physics & Physiology of Colour, read 2.4.2016.
http://www.greatreality.com/colour/ColourHVC.htm

Adobe Digital Index, The State of Mobile Benchmark, published online 2013. Study. Read 27.10.216.
http://success.adobe.com/assets/en/downloads/guides/13926_di_mobile_benchmark_final.pdf

Adobe Technical Guides, Colour Models. Published 2000. Manual. Read 2.4.2016
http://dba.med.sc.edu/price/irf/Adobe_tg/models/rgbcmy.html

Adobe Support, Working with video in Lightroom. Published 2015. Manual. Read 27.10.2016
https://helpx.adobe.com/lightroom/help/video-lightroom.html

Adobe Support, Adobe Lightroom tutorials. Published 2015. Manual. Read 27.10.2016.
https://helpx.adobe.com/lightroom.html

Albers, J. 2013. Interaction of Colour. (50th Anniversary Edition) New Haven & London: Yale University Press, 1-20.

Alton, L. 2016. Visual Storytelling, Digital Marketing, and 2016 Trends. Smart Insights. Read 27.10.2016.
http://www.smartinsights.com/digital-marketing-strategy/visual-storytelling-digital-marketing-2016-trends/

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2016-17 Edition, Photographers. Published online 2015. Read 27.10.2016.

http://www.bls.gov/ooh/media-and-communication/photographers.htm

Carucci, J. 2013. Digital SLR Video and Filmmaking for Dummies. Dummies.com. Manual. Read 17.11.2016.
http://www.dummies.com/photography/video/filmmaking-dslr-vs-video-cameras/

Freeman, M. 2005. Digital Photography Expert (Color). East Sussex: The Ilex Press, Limited. 10, 16-114.

Gamel, C. 2011. Transitioning to Video. Read 17.11.2016.
http://chrisgamel.com/transitioning-to-video

Geffin, D. 2015. The Power of Colour Grading and The Benefit It Can Have On Your Work Summarized in Two Minutes. Read 17.11.2016.
https://fstoppers.com/originals/power-colour-grading-and-benefit-it-can-have-your-work-summarized-two-minutes-54438

Gurney, J. 2010. Colour and Light: A Guide for the Realist Painter. Andrews McMeel Publishing. 75. Read 31.3.2016.
https://books.google.fi/books?id=MvddjqkQy9UC&pg=PA75&redir_esc=y#v=onep-age&q&f=false,

Harmer, J. 2015. Photoshop Vs. Lightroom. Improve Photography LLC. Read 27.10.2016.
http://improvephotography.com/34591/photoshop-vs-lightroom/

Hullfish, S., Fowler, J. 2009. Colour Correction for Video. Oxford: Focal Press, Elsevier Inc. 237-238.

Johnson, J. 2010. Mastering the Histogram in Adobe Photoshop Lightroom. Envato Tu-tus+. Manual. Read 17.11.2017.
https://photography.tutsplus.com/tutorials/mastering-the-histogram-in-adobe-pho-toshop-lightroom--photo-4278

Klingenberg, F. 2013. Colour theory continue, white balance. Manual. Read 18.11.206.

http://www.fredrkl.com/blog/colour-theory-continue-white-balance/

Malpas, P. 2007. Capturing Colour. Lausanne: AVA Publishing SA. 18-23.

On Device Research, published onine 2015. Mobile Video 2015: A Global Perspective. Study. Read 4.10.2016.
http://www.iab.com/wp-content/uploads/2015/06/IAB_Mobile_Video_Usage_FI-NAL.pdf

Rouse, M., Wigmore, I. 2012. Plutchick's Wheel of Emotions. Read 18.11.2016.
http://whatis.techtarget.com/definition/Plutchiks-Wheel-of-Emotions

Schloss, K, B., Palmer. S, E., published online 2010, Aesthetic response to colour combinations: preference, harmony, and similarity. Study. Read 2.4.2016.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3037488/

Viggiano, J A Stephen, Comparison of the accuracy of different white balancing algorithms as quantified by their colour constancy, Sensors and Camera Systems for Scientific, Industrial, and Digital Photography Applications V: Proceedings of the SPIE, volume 5301. Bellingham, WA: SPIE: The International Society for Optical Engineering, 2004, in press.
http://www.acolyte-colour.com/papers/EI_2004.pdf

Zhang, M. 2015. What Colour is This Dress? Is it Under or Over Exposed? Read 18.11.206.
http://petapixel.com/2015/02/27/what-colour-is-this-dress-is-it-under-or-over-exposed/