

GEECT/European Film School Network

Teaching Cinematography: From Film to Digital

La Fémis, Paris, 23-26 February 2013

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List of participants

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UCA Farnham, UK
- **Michael Bertl**
Dffb, Germany
- **José Bogalheiro**
Escola Superior de Teatro
et Cinema, Portugal
- **Anders Bohman**
Academy of Dramatic Arts,
Sweden
- **Mark Carey**
Northern Film School, UK
- **Eol Çashku**
Academy of Film and
Multimedia, Albania
- **Rolf Coulanges**
EICTV, Cuba (Guest)
- **Philip Cowan**
Newport Film School, UK
- **Marc de Backer**
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Diffusion, Belgium
- **Florence Michèle Bergot**
ENS Louis Lumière, France
- **Germana Bianco**
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- **Andreas Birkl**
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- **Bartolomeo Corsini**
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- **Harriet Cox**
London Film School, UK
- **Caterina d'Amico**
Fondazione Centro
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Cinematografia, Italy
- **Barry Dignam**
National Film School,
Ireland
- **Matej Gyarfas**
VSMU, Slovakia
- **Lubomir Halatchev**
NAFTA, Bulgaria
- **Timo Heinänen**
ELO Film School,
Finland
- **Jean-Paul Jarry**
3IS, France
- **Marek Jicha**
FAMU, Czech Republic
- **Igor Klebanov**
VGIK, Russia
- **Kommer Kleijn**
RITS, Belgium
- **Kristina Klunkert**
IFS, Germany
- **Pierre Mennel**
Zurich University of the
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- **Priska Morrissey**
University of Rennes,
France (Guest)
- **Robert Nordstöm**
ARCADA, Finland
- **Arko Okk**
Baltic Film and Media
School, Estonia
- **Gerlinde Semper**
Filmakademie, Austria
- **David Slama**
IFS, Germany
- **Donald Taylor Black**
National Film School,
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- **Dirk Teenstra**
NFA, The Netherlands
- **Danielle Trastulli**
Milan School of
Cinema and
Television, Italy
- **Tatiana Tursunova**
VGIK, Russia
- **Kjell Vassdal**
Norske Filmskolen,
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- La Fémis France
Pascale Borenstein
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Pierre-William Glenn
Marc Nicolas
Frédéric Papon
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Marc Urtado
- MEDIA Programme,
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- CILECT
Maria Dora Mourao
Stanislav Semerdjiev

I. Introduction – Marc Nicolas

Marc Nicolas notes the large number of participants at this year's meeting of the European Film School Network, which has been organised with the support of the MEDIA programme. He welcomes the President and Director of CILECT who are also present today. This year's meeting has been organised at the same time as the AFC's Micro Salon industry trade fair for cinematography equipment.

The focus of the meeting will be the digital transition, the aim being to share the experiences of European film schools in addressing that transition. In particular, discussions will cover:

- a) A survey of equipment, workflows and investment decisions made by the film schools in response to the digital transition.
- b) The resulting changes in curricula and teaching methods – as well as the matters that will remain the same despite the shift from film to digital.

In the digital transition, the focus should be on finding the best way to teach students to make films with the equipment that is available today. A significant obstacle to be overcome is that of nostalgia for a bygone film era.

Pascale Borenstein thanks participants for responding to the La Fémis survey on the digital equipment owned or used by the film schools. She reiterates the fact that the value of these meetings lies in the opportunity they provide for discussions and sharing of experiences. They are aimed at opening up doors and developing networks.

II. Presentation of Film Schools

Participants present their respective institutions, in particular, their cinematographic departments. A range of BA and MA degrees were available although some schools did not grant formal degrees. Most schools had a specific cinematography department and were in the process of making the shift to digital. Nevertheless, many schools were still offering non-digital film projects to their students, at least for the time being.

- Marek Jicha, FAMU, Czech Republic.
- Rolf Coulanges, EICTV, Cuba, attending the meeting as a guest.
- Arko Okk, Baltic Film and Media School, Estonia offers a 3 year course with 6 cinematography students, as well as an MA degree.
- Kommer Kleijn, RITS-INSAS, Belgium offers a 3-year BA degree with 3-14 students, as well as an MA degree with 7-10 students.
- Timo Heinänen, ARCADA, Finland offers a 3-year BA degree and a 2-year MA programme.
- Jean-Paul Jarry, 3IS, France is a private school with a 3-year programme. The first 18 months are devoted to general studies, followed by an 18-month specialisation in production, directing, AD and script writing, cinematography, sound, editing, or TV journalism. An animation department was set up 2 years ago.

- Lubomir Halatchev, NAFTA, Bulgaria has a 4-year BA programme with 6-8 students per year.
- Caterina d'Amico, Fondazione Centro Sperimentale di Cinematografia, Italy offers a 3-year course with 8 students per year.
- Michael Bertl, DFFB, Germany, has 6 cinematography students per year
- Florence Michel Bergot, ENS Louis Lumière, France has 16 students per department per year, and a 3-year MA course. It is currently phasing out all its analog technology.
- David Slama, IFS, Germany.
- Kristina Klunkert, IFS Germany offers a BA degree with 8 new students every other year.
- Claire Barwell, UCA Farnham UK has a BA degree with 100 students per year, of which approximately 20 are studying cinematography. The school is still working with analog film.
- Dirk Teenstra, NFA, The Netherlands has a 4-year BA programme, and a 2-year MA programme, with 8 students per year. 2013 is the last year the school will be working with analog film.
- Mark Carey, Northern Film School, UK has over 400 students including 25 cinematography students.
- Marc de Backer, Institut des Arts de Diffusion, Belgium has 25 students in the BA programme and 6 in the MA programme.
- Donald Taylor Black, National Film School, Ireland does not currently offer an MA degree in cinematography although one is planned for the future. The BA programme has 30 students, with 4-6 specialising in cinematography.
- Barry Dignam, National Film School, Ireland.
- Germana Bianco, Milan School of Cinema and Television, Italy has a 2-year cinematography course with approximately 14 students per year.
- Daniella Trastulli, Milan School of Cinema and Television, Italy also offers a special course in film making for journalists
- José Bogalheiro, Escola Superior de Teatro et Cinema, Portugal has a BA programme and an MA programme. The cinematography department has 6-7 students per year.
- Christina Fernandez Estrada, Project Officer MEDIA and GEECT member.
- Eol Çashku, Academy of Film and Multimedia, Albania has a 3-year BA programme with 5 cinematography students. The school is already all digital.
- Stanislav Semerdjiev, Bulgaria, Executive Director CILECT
- Maria Dora Mourao, Brazil, President CILECT, which hopes to have a close relationship with all participants.
- Harriet Cox, London Film School, offers a 2-year MA programme, and also has PhD students in cinematography.
- Anders Bohman, Academy of Dramatic Arts, Sweden has an intake of 4 cinematography students every second year.
- Robert Nordstrom, ARCADA, Finland has a 4-year BA programme, including 5 cinematography students per year.
- Kjell Vassdal, Norske Filmskolen, Norway has a student intake every second year. The school has 7 film departments with plans for an MA. Students are

increasingly shooting on digital although they are still very interested in learning to shoot film.

- Matej Gyarfas, VSMU, Slovakia has a BA, an MA and an Art PhD programme. Approximately 6 cinematography students are enrolled each year. Next year will probably be the last year that the school uses film.
- Igor Klebanov, VGIK, Russia has 25 students per year.
- Tatiana Tursunova, VGIK, Russia.
- Bartolomeo Corsini, Fondazione Centro Sperimentale di Cinematografia, Italy has a specific cinematography course.
- Philip Cowan, Newport Film School, UK offers BAs in fiction and documentary, and an MA programme.
- Gerlinde Semper, Filmakademie, Austria offers a 3-year BA and a 2-year MA, with 15-20 cinematography students
- Andreas Birkl, Zurich University of the Arts, Switzerland is replacing Christian Iseli at the meeting.
- Pierre Mennel, Zurich University of the Arts, Switzerland offers a 2-year BA programme and a 2-year MA programme, with 6 cinematography students each year in the BA course.
- Priska Morrissey, University of Rennes, works in the area of the history of cinematography.

III. Keynote Speaker 1: Pierre-William Glenn

Pierre-William Glenn, Director of Photography and Head of the Cinematography Department at La Fémis, begins by noting that despite the outstanding qualities of film, it is clearly being phased out of the industry and hence of the film schools. The tension between old and new has always existed, and film itself developed over the past century on the basis of consecutive waves of technological progress. The need to continue teaching traditional skills – and in particular the conscientiousness that went with them – means that the La Fémis curriculum combines theory and practice. It is important that students in all departments study the digital processes that will be required to produce films in the future.

Given this need to put theory into practice, the range of equipment available in schools is key. The technology is developing rapidly leading to the inevitable obsolescence of subsequent waves. La Fémis has therefore opted for a partnership system with equipment rental companies. In terms of screening, La Fémis now has 4K and 2K projectors and provides training in digital grading to students. The primary goal is to train top grade assistant DOPs. With a limited number of students (6 per year), they have every chance of finding a job on completion.

Pierre-William Glenn concludes with his belief that the cinematographer should retain total control of the image produced. Otherwise, the film shoot is in danger of becoming total chaos.

Discussion. For Marek Jicha, this is a question of alchemy and the role of the cinematographer should be that of an alchemist – not necessarily working in total transparency. Many different technological options are available today and there is as

yet no clear winner, making it difficult for film schools to decide on which direction to take. Today the camera is simply a computer with a lens – although the lens is clearly the most important part of this piece of equipment.

For Arko Okk, a central quality of film was the "hidden" nature of the images which only became visible *after* development. Those working in film had to use their imagination and trust in their own know-how and experience. That is a key skill that today's students still have to learn. Pierre-William Glenn notes that the raw image that appears on a monitor is also a **hidden image**. What you can get out of that image is very dependent on your know-how. Marc Nicolas used to believe that the hidden image was important. However, he now believes that the art of cinema is more like the art of music – an interpretative art. When it became possible to listen to music as a recording rather than as a live performance that changed the very way that music was made. A similar creative shift is now occurring in film. For Robert Nordstrom, the most important lesson to teach students is to learn to see the image in their heads before they see it on the screen. Film was a very good way of learning that skill.

Kommer Kleijn believes that film is clearly on its way out regardless of the merits or advantages it might have. He is therefore interested in identifying what it is about film that gives it added value vis-à-vis digital, and transposing that added value onto digital. For example, when using film it is necessary to think *before* shooting and that is a lesson that students using digital cameras should also learn.

For Mark Carey, this raises the question of **the cinematographer's role**: is it merely a technical role, recording the film for others to play around with later, or is the cinematographer in control of the image?

Pierre Mennel believes that learning to shoot a 35mm film should remain the master process for filmmaking due to the concentration and attitude that is required. Shooting a film is and should remain a creative process. It should not become a gathering of people who are simply making options for later treatment (in post-production).

Timo Heinänen agrees on the importance of concentration. When making a 35mm film the crew is completely concentrated on the scene being shot. Once a monitor is used, there is a tendency for everyone to congregate around the monitor.

For Kommer Kleijn, the crucial issue is how to maintain control of the artistic process while using modern technology. Students have to be taught how to maintain control and follow their images through post-production and even into the projection stage.

Daniella Trastulli notes that, in the past, the work of the DOP was quite separate from that of the editor. Today, cinematography students also have to learn colour correction, editing, and other post-production techniques. In that way they see how the images they shoot can be changed over the course of the film process.

For Kjell Vassdal, cinematographers will continue to play a very important role in the future as all directors need good cinematographers to tell their story. The Alexa camera is close to a film camera in terms of operation.

IV. Keynote Speaker 2: Matthieu Poirot-Delpech

Matthieu Poirot-Delpech, DOP and President of AFC France, was a La Fémis student at a time when all teaching was on film cameras. He talks about the changes he has witnessed in the industry over the past 10 years and believes that it is now possible to use either a 35mm camera or a digital camera to obtain the same result – they are both concerned with making films.

Ten years ago, the first HD cameras were not ideal and were used rather reluctantly. Since then, the size of the sensors has evolved enabling a better depth of focus – a crucial parameter in film making. The new sensors make it possible, for example, to shoot in candle light.

The roles of the DOP and the director have also changed. While students are keen to master the technical side of the camera, the question of light and optics should not be ignored. Cameras are made to respect the principles of human vision. Students therefore have to learn to use their eyes rather than their video assist, and film schools should play a role in forcing students to open their eyes. Some DOPs work with their video assist in a black tent, removed from the director and the actors. That is probably not the ideal way to make movies. It is important to teach both DOPs and directors their place on the set but that is increasingly a challenge today.

Grading used to be an expensive step in film production. The equipment available today means that it is now possible to do colour grading in the film schools at a fraction of the cost.

Discussion. Andreas Birkl raises the use of exposure meters and student awareness of light levels and related matters. Matthieu Poirot-Delpech explains that he no longer uses exposure meters as skin tones are better with blue gel when shooting in tungsten. Students tend to use the meters whereas film obliged them to use their eyes.

Caterina d'Amico advises that her students are relatively conservative; they still want the experience of working with film. Light is at the heart of her cinematography course, much more so than the camera itself. The aim is to create atmosphere, accompanying the mood of the film with light. An Italian ad campaign some years ago carried the slogan: *Don't think, shoot!* That is outrageously wrong from an educator's point of view. Digital cameras give students more freedom as the shoots are much less expensive. However, the disadvantage is that students now end up with hours and hours of shot material. The school has therefore imposed a limit on the ratio of stock per minute of film to be produced. Cinematography students are also given limited time slots for the shoots. However, teachers in the Directing department question the rationale behind such constraints given that the technology has finally freed film makers from the need for expensive and time-consuming film development processes.

Matthieu Poirot-Delpech agrees that image departments tend to **impose limits on students'** time whereas directing departments feel they do not need such constraints. There is a similar trend in professional life, with directors wanting to film rehearsals for example. He believes that a film set is less like an orchestra and more like an architectural project, with each person carrying out a very different task. During a

recent film shoot, the director announced that there would be a maximum of 3 takes per shot. This had a very positive result with everyone, including the actors, being highly concentrated. The actual time spent filming was exceptional. However, it remains difficult to convince students of the advantages of such constraints.

Marc Nicolas advises that students at La Fémis have progressively placed limits on their own shooting times over the last 3 years. Initially there was an explosion in the material shot but this has now quite naturally decreased.

Michael Bertl has not seen such self-control in his school; quite the reverse. This is a particular problem for the Dffb as it does not have a formal diploma programme. Students therefore keep editing and tweaking their films, sometimes for years. Marc Nicolas explains that requiring a film to be ready for a diploma places a natural limit on the time spent on it. In addition, students' editing time can be limited. Matthieu Poirot-Delpech would like to find a way of restricting students without imposing a *formal* constraint on them, which is difficult to justify.

Timo Heinänen reports that his students are actually happier once they are given limits. Matthieu Poirot-Delpech adds that, in real life, it is necessary to respect film schedules. Colour grading used to be a dynamic process that did not stop at each image. With digital grading, there is a tendency to spend hours on each image and people forget that these are not meant to be individual pictures.

Robert Nordstrom agrees that imposing limits is good for creativity. For example, first year students at his school are limited to the use of 2 to 3 lenses, and the use of natural light only.

V. Aaton Digital Camera Presentation

Jean-Pierre Beauviala, Director of Aaton, presents the Delta Penelope digital camera developed by Aaton to be as close to a film camera as possible. This optical viewfinder digital camera has an internal SSD recorder, is low on noise and on power consumption, and records in DNG format – a totally open format with very simple workflows. It is possible to shoot for up to 3 hours with 2 batteries. Onset dailies can be processed at very high speed on any PC. The camera uses a Dalsa® CCD sensor for very high quality colour transparency. This is a reflex camera with a 180° shutter.

A screening of shot material demonstrates the purity of colour and skin tone *before* any colour grading, as well as the film-like depth of focus. The following points were raised by participants:

- The camera has resolved infrared-related problems.
- The camera will eventually be available with a 3-stop system.
- Basic sensitivity is 800.
- 3 cameras have already been sold to rental companies in France.
- Data digitalisation in the camera is purely linear.
- The camera is in the €80,000 price range, comparable to other cameras of this type on the market.
- The shutter can be closed to 90°.

- The highest speed that can be shot is 30.
- The data is not compressed at all as Aaton believes this is a matter for post-production.
- The camera weighs approximately 6.5 kg weight with the battery but minus the lens.
- SSD disks cost about €150 each, which is very inexpensive compared to other systems.
- White balance is no longer a concern with a silicone sensor.
- The camera has not yet been used to shoot a feature film.
- The sound synchronisation process, with a high quality time code generator, is exactly the same as that of a film camera.
- The camera operator has to keep his or her eye on the eye piece.

VI. Panel 1: Digital Equipment in European Film Schools

Marc Nicolas introduces the first panel session, led by Marc Urtado, Technical Director of La Fémis, which will be devoted to digital equipment and post-production. In some cases, the workflows chosen can be more important than the cameras themselves. The range of options now available is also so much greater than in the past. Marc Urtado provides an overview of the surveys completed by participating film schools.

1. Cameras

There were two main families and two sub-families of cameras:

- HD cameras
 - small, multi-use HD cameras (eg CANON XF 100)
 - middle-range HD cameras (eg SONY EX3 or PANASONIC HVX 200).
- Large sensor cameras with interchangeable lenses
 - full-frame middle range HD cameras (eg SONY F3 replacing 16mm)
 - professional cameras (eg Alexa replacing 35mm)

Regarding **DSLRs**, students in most film schools had their own DSLR cameras. Some schools also used DSLRs. Mark Carey considered the DSLR as an interim camera, and a number of schools used the DSLR for animation projects (Kommer Kleijn, Matej Gyarfás) or short, quick assignments (Timo Heinänen). Andreas Birkl used the DSLR for first year students and Pierre Mennel considered the camera a good learning tool. Students liked the technology but, within the industry, the DSLR seems to have had its day.

In terms of the **middle-range cameras** used, several schools used the Sony F3. Eol Çashku opted for the Sony Z7 for budgetary reasons. Lubomir Halatchev noted that Bulgaria's last film lab will be closing this year. There was therefore no point in continuing to teach students film. His school rents Alexa or RED cameras as needed, a cheaper alternative to buying them outright. Philip Cowan's school opted for the Panasonic P2 and not the DSLR as it is laid out like a professional camera. Gerlinde Semper's school uses the Panasonic P2 as an interim solution. Mark Carey's school uses the Sony NX5 for training in the initial years and for documentary projects. Eol

Çashku advises that Sony has just launched a new 4K-ready camera that is quite affordable.

Regarding **2K cameras**, the bulk of schools had Alexas, with 3 schools having REDS. None of the schools had EPIC cameras. Fewer than half the schools rented Alexas rather than buying them. Kommer Kleijn used 16mm film lenses on the RED 1. Harriet Cox noted that her school made a relatively rapid shift from the 35mm to the Alexa but was still trying to find a solution for replacing its stock of 16mm cameras. Michael Bertl was also transferring existing lenses to the REDs as the school simply did not have the budget to buy all new equipment.

Marc Nicolas noted that, in the past, La Fémis had four 35mm cameras and twelve 16mm cameras. All student films could therefore be shot on La Fémis' own equipment. Today, the school has 3 Alexas, and it is necessary to combine its own equipment with rentals, loans, etc. Do the schools think that they will one day have a full stock of digital cameras? Most film schools confirmed that such combinations were also standard practice for them. Dirk Teenstra advised that his school never had a stock of 35mm cameras. It invests in lights, lenses, and other equipment but does not buy cameras over €20,000. It is waiting for the technology to come to a standstill before making major investments. Rolf Coulanges noted that Cuba closed down its film development labs a few years ago, although students still preferred working in 35mm. Gerlinde Semper advised that the Filmakademie Wien was replacing all its film cameras, investing in the F5 or F55 optical systems for better students. Her cinematography students were very interested in the Aaton Delta Penelope. Mark Carey's school was planning to buy some cameras for the middle-range: the C300 and the C350. At the lower end, it was looking at Black Magic which comes with a free version of DaVinci. A number of other schools were also considering Black Magic.

2. Post-Production

With respect to post-production, Marc Urtado explained that the 2 market leaders were well represented in the schools: APPLE Final Cut Pro and AVID Media Composer. There were more differences between the schools when it came to colour grading. La Fémis had 2 relatively inexpensive MAC Pro grading stations equipped with high quality BARCO monitors. Most schools use that system and only 2-3 schools had more powerful grading stations. For example, Michael Bertl explained that the Dffb invested heavily in post-production some years ago, and that has proved worthwhile. Marek Jicha advised that FAMU had opted not to buy cameras but to invest in building up robust post-production facilities. Kjell Vassdal's school set up a proper grading suite some years ago, and started using Resolve last year. Professionals are brought in to supervise grading, and it is important that students see how this is done. Jean-Jacques Bouhon added that La Fémis students are initially given a supervisor (often an alumnus) but the aim is for them to do the grading themselves.

A limited number of schools specifically taught grading, including La Fémis and VSMU. The Dffb was thinking about introducing a **grading course**.

3. Network Based Systems

Marc Urtado advised that the first affordable network based system appeared 2 years ago – the AVID Isis – which links together all the post-production facilities in the same network, including projection rooms. Students have been very enthusiastic about its introduction. Caterina d'Amico's school has just introduced a network based system but has not yet evaluated the advantages or risks of such a system. Most of the other schools were also connected, although the IADT (Ireland) and the Milan School had reverted to a non-network based system.

4. DCP

When it came to DCP, Marc Urtado stated that La Fémis had 2 screening rooms equipped with digital projectors. It used a software solution for DCP, some of which was done outside the school. Kommer Kleijn believed it is important to teach students about the potential of DCP, a subject often overlooked by film schools. Anders Bohman advised that his school was installing an encrypted DCP system, whereas Marek Jicha used open DCP software.

5. Screening

With respect to screening, only a few schools were equipped with 2K digital projectors mainly for budgetary reasons. Most schools had HD projectors. Kommer Kleijn noted that HD was not perfect but was probably sufficient for educational purposes. A high quality home projector was used in the grading rooms with good results.

6. 3D Productions

Marc Urtado concluded with a few comments on 3D production. The survey showed that there was not much in the way of 3D production among the schools, with only 4 schools having produced 3D films and no real interest shown by the others. For Mark Carey, there had been 3D waves every 30 years or so and the current wave was already over. In contrast, Kommer Kleijn believed that, this time, the trend was here to stay albeit in a modest manner. Kjell Vassdal's school had already produced 3D films. Andreas Birkl's school provided support to 3D projects but this was not a major focus for the school. Arko Okk's school had workflows for 3D but student interest was limited. Timo Heinänen's school held master classes on 3D language and workflows.

VII. Panel 2: Workflows in European Film Schools

1. Igor Klebanov/Tatiana Tursunova, VGIK, Russia

Igor Klebanov believes that digital technologies have a number of disadvantages, in particular, with respect to colour rendition but also with respect to screening and projection. Moreover the technologies have yet to be standardised. Only when these issues have been resolved will pixel be able to oust grain. In addition, it is still necessary to learn to think properly before shooting – today's students have a tendency to shoot hours of footage for a 5-10 minute project.

VGIK is currently revising its syllabus, introducing new disciplines and determining their place in the curriculum. Subjects such as the Basics of Digital Photography Equipment, Technology and Equipment for Video Films, and Digital Technologies of Film and TV Production will continue, while subjects such as Film Processing, Film Equipment, and Exposure Metering are likely to be reduced in the future. A new 3D film course has also been introduced to the cinematography department.

A snapshot of the VGIK equipment range is provided: Telecine transfer, 2K-4K digitisation, Lustre colour correction, Clipster video workstation, ARRI lighting system, 5xArri Alexa cameras, ADR and Foley recording studio, etc. Retaining maintenance staff is a challenge for the school as, once they are trained, they tend to leave the school for (more highly paid) jobs in professional film studios and labs.

Today, directing students at the VGIK make 4 films during their course; DOPs shoot 7 films. The majority of students continue to lean towards film rather than digital. However, digital is progressing and all diploma films are shot on the Alexa camera. Next year there may no longer be any non-digital films made, especially given the difficulty of getting films developed by labs in Russia.

2. Kjell Vassdal, Norwegian Film School, Norway

Kjell Vassdal began by explaining that his cinematography students were still very eager to shoot on film. The school had 2 Alexa cameras, and has also done some 3D films (with 2 Epic cameras) and films on the SI3K camera (used on *Slumdog Millionaire*). Almost everything is edited on Avid Media Composer using DNxHD36 or 185. The school has its own grading facilities, using Resolve with good results. Dirk Meier, a German colour grader, has had a huge input into setting up workflows for the school.

For films shot on Alexa, ProRes 4444 is used transcoding to DNxHD36 for editing in AVID Media Composer. For non-digital films film, the negative is processed at STOPP in Stockholm which delivers material as DNxHD36 and/or 185, or sometimes in DPX 2K sequences. All film development labs in Norway, Denmark and Finland have been closed down. The only remaining Nordic lab is located in Sweden. Film is also edited in AVID Media Composer. Films are screened directly from AVID to the in-house projector in DNxHD 185 quality. The school can also do its own DCP for films screened in a cinema. When it comes to sound, ProTools are used together with AF export.

Back up is a challenge. It is done either through Nexto DI (easy) or MacBook Pro to hard drives (more difficult). PIX is also being used for recording and playback on set when shooting with an Alexa. This is currently being tested for Alexa and Panasonic shoots to record both image and sound, avoiding the need to sync sound later. Another option is to use Black Magic HyperDeck.

Another major challenge concerns the storage of material for the future. What format should be used? How much material should be stored? How can student films be screened in the future? The school does a DCP for diploma films but not necessarily for other projects.

3. Discussion

Marc Urtado noted that La Fémis faced the same issues with respect to **archiving**. It used a 2-level system: (a) on hard disk for second year productions with generation of proxies, and (b) on LTO tape, which allows one to access films within 40 minutes. The school used the JPG format. NFA Amsterdam was considering the use of LTO tapes. FAMU used LTO 5. Rolf Coulanges had opted for LTO as the use of hard disks was an issue in tropical countries. Claire Barwell added that Kodak was now recommending the use of its asset management stock for securing archives.

Marc Nicolas asked for details of the film **development labs** still in operation in the countries present.

- Slovakia relied on labs in the Czech Republic.
- The Netherlands used Belgian labs.
- There were no remaining labs in Ireland, Portugal, Cuba or Estonia.
- There were 2 labs in operation in Vienna.
- The Bulgarian lab would close at the end of 2013.
- There were 3 labs still in operation in Rome for colour film, but it was virtually impossible to have black and white film processed in Italy today.
- The UK had a few tiny labs still in operation but all the big labs were closing. It was still possible to have black and white film processed in the UK
- There were 5 labs in Germany (including 2 in Berlin), and it was still possible to have 16mm prints and rushes processed.
- There was one lab in operation in Madrid.

Marc Nicolas noted that, as a result of all the lab closures, the two ends of the film process – the film schools and the archives – might one day have to join forces. Caterina d'Amico agreed. That was why her school offered a specific course in archiving. Kjell Vassdal advised that his school hoped to be able to continue to shoot on film for some time. When it becomes impossible to buy or process film stock, that will obviously have to come to an end. He believed that 20-30% of projects will be done on film in the coming years.

Andreas Birkl asked whether any other **editing systems** were being used apart from Avid and Final Cut. Eol Çashku advised that Flame, a free system, was quite good and allowed users to choose from a range of interfaces. Some schools were using Adobe. The London Film School used ProRes for Alexa shoots. Kjell Vassdal's school had always used Avid but was currently testing other options. Marc Nicolas noted that it was probably preferable to have the whole school using one system only.

VIII. Panel 3: Teaching – What Must Change

1. Harriet Cox, London Film School, UK

The LFS receives no public subsidies. Students do not specialise in any particular aspect of film making and are encouraged to participate in all technical roles. There is no specific directing department, and the school tries to closely mirror industry practice. Last year, 10 films were shot on film, and 75 on digital.

The LFS was very reluctant to make the transition to digital capture. Nevertheless, in the last 10 years, the proportion of digital films made has grown from 10% to 90%. Students undertake five 12-week terms plus their graduation film which can take up to one year. The Alexa is introduced in Term 5 of the school's programme and has had a number of implications, not least of which has been the need to teach IT skills. On the Alexa, the decision was made to capture on Log C, which is not a viewing format. With respect to lighting, the Alexa is rated at 500 rather than 800. The school will continue to teach light metering. The students initially requested on-set monitoring, but now prefer to work without the monitor in order to retain decision-making at the level of the camera. With the introduction of digital, a number of new roles have also had to be introduced including joint DIT, clapper board, etc.

All student exercises are included in the fees paid, and each unit has a budget for transport, food and production design. On-set decision making is encouraged, as is on-set camera effects. The school has not yet opted to use green screen, which comes with its own set of complicated issues, but this will probably have to be introduced in the near future.

The biggest implication of the digital transition has been on time and maintaining the rigour of the photochemical process. Students have to schedule to see all the rushes the day after they are shot. This forces them to restrict themselves as the time spent watching rushes is deducted from their shooting schedules. This works to make them take responsibility for their choices.

The LFS has opted for the "format free" principle: the same teaching is provided regardless of the format the student is shooting in.

2. Mark Carey, Northern Film School, UK

The NFS has over 400 students, primarily undergraduates, in all disciplines. The school is waiting for the right moment to make the shift to new workflows and methods – not because it is attached to film but mainly for budgetary reasons. He believes that the digital transition raises 2 main questions: the future of cinematography teaching, and the future of cinematography itself. It has also resulted in a significant shift in power away from the director. At the same time, the technology is moving very fast and becoming obsolete very quickly. Next year may see a new technology that replaces the Alexa.

Mark Carey refers to the documentary, *Side by Side*, produced by Keanu Reeves, which explores the digital revolution – what has been gained vis-à-vis photochemical filmmaking, what has been lost, and what the future might bring.

If film schools are to remain relevant, it is necessary to integrate the new technologies and workflows into their teaching. These were obviously much more complex than traditional film processes. New subjects that could potentially be taught include image management from set to post, virtual cinematography, videogames cinematography, digital lighting, grading, visual effects, digital manipulation etc. For film schools this comes down to a question of time (and hence money). If new subjects are added to curricula then other subjects will have to be dropped.

This is an opportunity to create a new breed of cinematographer that is at the heart of the work being created rather than someone who is simply responsible for the shooting of an ever-reducing live action project. There has already been a huge change in the power that DOPs wield and in how influential they are. In order to maintain the significance of the DOP, and even regain some lost ground, it is necessary to consider the concept of the "director of imaging" – a person responsible for the look of the film from beginning to end. If that is not done, the DOP is in danger of being relegated to more of a technical function.

Mark Carey concludes by stating that the film industry has already gone through many changes; the digital transition is simply the latest example of that. Film schools should therefore embrace the changes and even lead the way.

3. Michael Bertl, DFFB, Germany

The DFFB does not have a formal BA or MA programme. Each year the school takes on 6 cinematography students, 12 directors, and 6 producers. The first film they shoot is a documentary, with each having to carry out all the different roles involved. Twenty-four 5-10 minute films are shot each year, which imposes certain restrictions in terms of time and the number of takes allowed.

Specialisation begins in the second year of the course. In the cinematography department, the focus is not on the technology but on opening up the students' eyes. The aim is for them to have a vision, make the relevant decisions, and realise that vision. The second year films can be shot on film or on digital.

In their third year, students take a number of master classes. Three students work on each film (cinematographer, director and producer) and they receive a budget for the film. 5-minute films are also produced in conjunction with German television.

Four to five years ago, the school began to prepare for the digital transition while maintaining the quality, values and standards of traditional film making. Four main issues have arisen in the transition.

- The need to focus and concentrate one's vision in a digital context. The motto here is "don't shoot, think!"
- The need to avoid the pressure for all that is newer, faster and better, and the idea that the latest tools will make the best movies. In this area, it is difficult to convince students to work with smaller cameras.
- The need to retain control of one's work and one's art. This includes the issue of how to organise the new sequences of workflow between shooting and post-production. Determining workflows could involve working backwards from "where will the film be shown" to "how should the images be captured". Retaining control requires having a clear vision and following that through into post-production (including grading).
- The issue of who will actually watch the movies that are made.

Generally speaking, it is necessary for film schools to establish a stronger culture of communication between staff and students. Having in-house post-production facilities

makes it easier to control one's own images. In conclusion, in a world where anyone can make movies and we are all surrounded by images, the film schools face enormous challenges.

4. Pierre Mennel and Andreas Birkl, Zurich University of the Arts

Pierre Mennel and Andreas Birkl present a research project, *The Emotional Impact of Film Recording Processes on the Audience*, in which the same three short films were shot with a digital (ARRI Alexa) and a 35mm camera. The films were tested with a number of audiences to determine whether the format influenced the way the audience engaged with the films. The screenings were carried out with the Berne Department of Psychology, Berne. About 420 people have been tested so far with respect to their pulse, eye-movements, and skin resistance (further details were available on *Filmwissen.ch*). The audience was not aware of which version they were watching. Different audiences were shown the films in different orders.

Findings included the fact that if the images were shown one by one, without sound, the audience preferred the 35mm film. However, if they were shown as a finished film, the audience did not necessarily have a preference.

Another research project is concerned with “visual storytelling” – that is, how one bridges the (enormous) gap that exists between the initial script and the final movie.

5. Kristina Klunkert, Internationale Filmschule Cologne, Germany

The IFS is a relatively small school. The first year is devoted to a range of topics and students can then decide in which area they wish to specialise. First year students have to direct a documentary on a small DV camera. They are limited to 6 hours of shooting per day. Today's students have grown up in a digital world and are used to looking at monitors rather than through classic viewfinders. As a result, the school teaches digital techniques first, moving to analog film later including analog editing which requires a different discipline.

The IFS believes that filmmaking in the digital age requires much more open communication between people and departments, and a greater amount of open-mindedness. Similarly, a good DOP has to master editing and grading techniques much more than in the past. This is also blurring the lines between the filming and editing departments. A seminar has been introduced for all departments on post-production supervision.

6. Discussion – The Role of the DOP

Marc Nicolas opened discussions by noting that, in today's French film industry, there were 3 sound positions: sound engineer, sound editor, sound mixer. There is no longer any one person in charge of sound. In the future, one could imagine that there could be 4 image positions: lighting, framing, DIT (**digital imaging technician**), and grading. A DOP diploma would therefore have to provide training in those four positions. However, others argue that DOP should remain the master of the entire process. The DOP should be able to *manage* all of those positions without necessarily mastering

them all. Otherwise, there will be total chaos. Finally, others argue that the real boss of the film is the director.

Rolf Coulanges advised that graders have now been invited to become members of the German Federation of Cinematographers. This reflects the fact that filming and post-production are part of the same process and that grading will be an essential part of cinematography in the future. In one way, the process is going back to the past in that the images shot cannot actually be seen as they will be screened until a later point in time. This is a good way of working as images have to be *imagined* first. Film schools should provide training in post-production to cinematography students.

Michael Bertl asked who was responsible for deciding how the film should *sound*, and how the film should *look*. He believed that it was important for DOPs and directors to work together. The post-production supervisor also played an important role.

Dirk Teenstra referred to a number of recent television series where each episode was made by a different director with a different DOP. However, they still look the same despite the fact that there was no overriding boss or "author". For him, the idea of an all-powerful director is an old fashioned concept.

For Kommer Kleijn, cinematographers did not need to master colour grading although they should be aware of the basic issues involved. He believes that the colour grader is to the DOP what the DOP is to the director.

Marc Nicolas noted that the sound mixer is in direct contact with the director and not with the sound engineer. This has occurred because of the technological progress made: as sound recording became more and more complex, new positions had to emerge. Jean-Jacques Bouhon, however, pointed to the difference between sound and image: it is currently possible to redo the sound on a scene that has been shot but it is not possible to redo the lighting.

Claire Barwell referred to suggestions that have been made for the creation of a position of Director of Sound just as there is a Director of Photography.

Kjell Vassdal tells his students that they have to protect their positions: they have to learn about all the different technical possibilities so that they are in a position to make decisions. If they let someone else take responsibility for certain decisions, they will lose their position.

Dirk Teenstra did not agree. Allowing someone else to make technical decisions did not weaken one's position, but strengthened it. This was not about a position but about creating a film.

Kommer Kleijn suggested that the cinematographer's role was to act as an interpreter from the script to the image. It was important for film schools to teach that role to their students.

Harriet Cox explained that, in the UK, colourists all learnt their profession on the job; this was never taught in the film schools. Marc Nicolas agreed on the need to train graders in the film schools. In that way, students would learn the entire

cinematography chain, just as sound students learnt the entire sound chain. Caterina d'Amico's school has just launched a course in grading within the cinematography department. It can also be taken by directing or editing students.

Marc Nicolas concluded by stating that, in 2 to 3 years' time, most film schools will be equipped with sophisticated grading tools. He also believed that film distributors and exhibitors should be trained in film schools and not in business schools. However, whether this should be done in-house was still a major issue for most schools.

IX. Panel 4: Teaching – What Must Stay the Same

Marc Nicolas opened the panel by noting that, in spite of the many changes underway as a result of the digital transition, certain matters have not changed and should probably be retained in the future. 8 years ago, he interviewed 10 DOPs for the position of Head of the Cinematography Department. Half told him they would change everything in the curriculum; the other half said they would change nothing. However, when encouraged to provide details, both groups had very much the same ideas about where their teaching was heading.

La Fémis has a 4-year film course. The first year is common to all students. They then specialise in the second and third years. Every three months they all come together again to work on project with each other. The fourth year was devoted to a personal diploma project made with a team of students they have chosen.

1. Jean-Jacques Bouhon, La Fémis, France

Jean-Jacques Bouhon noted that he did not believe that teaching was changing in a significant way. While there were many new technical subjects, the principles of storytelling remained the same – lights, lenses, framing, camera movements etc. The main concern was to ensure that students were aware that what they were doing was in the interests of the movie and not for themselves.

The fact that film stocks will not last forever means that film schools have no choice but to teach digital technologies. It used to be said that talent was not something that could be taught – you either had it or you did not. However, it is possible to teach people how to use the tools available to *express* their talent. The talent of the cinematographer is seen on the screen by his or her use of light and camera movement, and by his or her cooperation with the director. It is necessary to learn how to make decisions with the director as to the tools that will be used during the shoot, and to be comfortable in using those tools. This involves mastering framing, editing, the choice and use of lenses, make-up, filters, etc. The aim is to ensure that graduates will become good assistants once they enter the industry.

One of the challenges of the digital era is that people tend to postpone problems to the post-production stage. However, it is important for cinematographers to be able to make decisions together with the director, both before and during the shoot. Finally, students also have to be able to write about what they are going to do, and be able to report on what they have done after the shooting.

2. Philip Cowan, Newport Film School, UK

The NFS offers a BA course in film and video (fiction), a BA in documentary film, and an MA in film. The fiction course has a common first year. In the second year, the students specialise in two areas. In the third year they choose one specialty and work in production teams of 6 people. With respect to cinematography, the first year covers the basics of camera operation: focus, exposure, colour correction etc. The second year is spent on camera workshops (digital and 16mm), location and studio lighting, setting camera tracks, etc. In parallel, the students attend a series of lectures on the use of framing, placement, and light principles in storytelling.

Vladimir Nilsen's 1935 work, *The Cinema as a Graphic Art*, was the first book on cinematography by a cinematographer. He talks about 3 levels of cinematography:

- reproductional (recording something that is happening in front of the camera)
- pictorial (the look of the image in stylistic and aesthetic terms)
- representational (creating meaning within the image).

This raises the issue of the role of the cinematographer which is not only a technical role, but also a creative one. *Auteur* theory is a basic principle of film studies that implies that it is the director who makes all the creative decisions. However, this does not take into account the fact that film making is a *collaborative* exercise. Authorship is another important issue.

Philip Cowan has written two articles on these issues:

Underexposed: The Neglected Art of the Cinematographer, Journal of Media Practice 13: 1, pp. 75-96, Intellect: UK
Authorship and the Director of Photography: A Case Study of Gregg Toland and Citizen Kane, Networking Knowledge 5: 1, pp. 231-245, Media, Communication and Cultural Studies Association: UK – suggesting that Toland was perhaps responsible for more of the Wells aesthetic and storytelling than he is given credit for.

In terms of teaching cinematography, it is obviously necessary to continue to teach all the fundamentals of filmmaking whether it be film or digital. Similarly, the art of the cinematographer – creating meaning – is not digital-dependent, nor is the relationship between the DOP and the Director.

3. Kommer Kleijn, RITS, Belgium

The RITS teaches film projection – there is no point in creating the most beautiful and compelling images if a projector in a commercial cinema cannot show them. Kommer Kleijn is involved in the standardisation of digital cinema packages. The shift to digital cinema is happening fast but the standard is very new and not much is known about it.

Work is underway for a world standard in digital cinema distribution. The first standard document was voted on by SMPTE in 2006 and was confirmed by ISO in 2009. However, the standards work is still progressing. The goal of the standard is to describe minimum performance and to create compatibility. In particular, digital distribution should be able to do everything that 35mm distribution could do in terms of quality and functionality.

Kommer Kleijn believes that standardisation decisions have a profound impact on cinema as an art form, and it is important that film students are aware of the standards and their development, for example, with respect to frame rates. However, the literature is scarce on this and consideration is being given to developing a master class for film school lecturers on the standardisation process.

Working in high frame rates (HFR) has certain advantages for storytelling: enhanced movement portrayal, absence of judder, relief from movement interdiction, and a spectacular enhancement of spatial resolution, both in terms of real detail and sharpness.

Finally, the digital transition also has implications for 3D stereoscopy. A slow but steady rise in 3D films is expected and film cinemas will need to address this in the years to come.

Kommer Kleijn advises that he or his colleagues are available to give a presentation on the standardisation issues if needed.

4. Dirk Teenstra, Nederlandse Film en Televisie Academie, Netherlands

Cinematography is about directing the attention of the viewer, primarily through framing and lighting. What is important is being able to master the tools, whatever they are. Cinematography students are incredible snobs and want to be able to use the latest and best equipment. The NFTA therefore attempts to provide them with the best affordable equipment available. However, it is how they use that equipment that counts – a poor camera operator will not be any better if working on an expensive camera.

The School also believes that it is no longer possible to make a film on your own. A film is a collaborative effort involving many different specialities and it is important to be able to work with specialists in each area.

The 3-takes policy helps to limit the amount of material shot in this digital age. It is important that cinematography students do not impinge on the time of editing students by shooting enormous amounts of material. Similarly, the cinematography student should not impinge on the director's time with his or her actors. A compromise is needed between all of those involved so that everyone has a fair share of the available time.

An interesting exercise that he performs is to have students shoot diametrically opposite subjects one after the other. This forces them to change their views and look at things differently.

[The meeting moved to the screening room for a documentary featuring an exquisitely filmed violin solo that was "on the edge of being perfect". Marc Nicolas noted that it evoked the famous quotation from Jean-Luc Godard: "Dans la prise de vue, qu'est-ce qui est le plus important – la prise ou la vue?"]

X. Conclusion – Marc Nicolas

Marc Nicolas concluded by stating that the aim of this meeting had been to provide participants with time for reflexion rather than just presenting information in a formal manner. Some of the points that emerged during discussions included:

- The presentations demonstrated the reasons that film was progressively disappearing. While this was partly due to technical progress, there had also been a change from the smaller, equipment makers that film schools worked with in the past to the big, multinational players that relied on very different marketing and commercialising methods.
- The digital shift was leading to totally different ways of working and even thinking about film, in particular due to the loss of the "hidden image" concept. It was no longer necessary to wait for the image to come back from the lab, and hence there was no longer a danger of huge mistakes being made. However, this danger has been replaced by a growing temptation to use the new "small screen" and to retake images endlessly.
- Another matter that had changed was the relationship between those involved in film making, in particular between the director and the DOP, and within the DOP's own team. This is the area in which the most change can be expected in the coming years. Cinematography now has closer links to grading and post-production than in the past, and it will be interesting to see how this will evolve in the next 5 to 10 years.
- In parallel to all these changes, there are many aspects of the process that will not change. The importance of learning to look and think, and the need to understand lighting will continue. Similarly, the fact that it is not possible to make a movie alone will remain a constant in the future.

XI. Other Matters

1. Expo Milan 2015

Caterina d'Amico distributed documentation relating to Expo Milan 2015, the theme of which is "Feeding the Planet, Energy for Life". In the lead up to the Expo, approximately eight 5-minute films will be financed on the subject of water. Film schools from around the world are able to submit projects for funding, and an information session will be held in Milan in October 2013.

Marc Nicolas added that all participants will shortly receive an email from CILECT concerning the project. He encourages participants to spread this information as widely as possible.

2. Source Material for Cinematography Students

Kjell Vassdal referred to his difficulties in drawing up a list of literature for students. Marc Nicolas suggested that participants could share their lists of such material. Maria

Dora Mourao (CILECT) advised that she will be approaching the film schools to draw up a list of books and films that students should consult. Mark Carey added that he was given a reading list for a course but much of it was outdated or irrelevant. He therefore asked his students to review a text on cinematography for their co-students, telling them why they should – or should not – read the relevant text.

3. Upcoming Meetings

The next GEECT conference will be held in the UK (Cardiff) in early 2014 on the topic of Teaching Documentary. Another conference on the television series will be held, probably in a Nordic country, towards the end of the year. The annual CILECT conference will be held in Buenos Aires in 20 September 2013 and will deal with the changes in teaching due to new technologies.

4. MEDIA Programme

In terms of the support provided for these meetings by the European Union, Marc Nicolas noted that most participants would be aware that the MEDIA programme would be merged with the Creative Europe programme in the coming years. The training component of the new programme will be concerned with continuous education only and no longer with initial training. This represents a major loss for the film schools present, and Marc Nicolas has been lobbying the EU on this matter. It may be that the newly designed Erasmus programme will be able to provide support for these meetings which play an important role in the development of film school programmes.