

Research Methodologies in Contemporary Cinematography

Cinematography as a research subject can overarch a plethora of disciplines, as this art form combines an array of artistic practices and multifarious technological advancements. Because of its broad applications and theoretical developments that are inherited from painting and photography, researcher-practitioners can identify timely questions to ask, particularly in a digital economy whereby traditional cinematography has morphed into a craft that its best achievements are heavily mediated through digital technologies. Virtual assets have been integrated into final pixels represented within a cinematographer's viewfinder. However, this pragmatic and interdisciplinary characteristic, I argue, could set hurdles up for research on cinematography to leap over. This article aims to answer my own enquiries about methodologies and experimental design when I work in a UK higher education institution as an Early Career Researcher (ECR). With my brief review, I hope colleagues who have been conducting their research in different approaches can synthesise various advantages for later investigations.

Higher Education institutions function as a stronghold for producing original knowledge, and PhD qualifications are regarded as the highest achievement deriving from the rigorous trainings and investigations in specific subject areas. PhD degree holders, after completing structured programmes, acquire in-depth knowledge that can benefit academia milieu, communities and businesses for a better future. Considering the quality of the research work and strict progression reviews that are involved for a PhD degree award, I shall start my discussion with scrutinising methodologies in selected PhD theses as the benchmark.

Mix-methods Research

It is not surprising to find that PhD thesis authors opt for mixed-methods research methodologies, as they obtain data for both qualitative and quantitative analyses. In *Emotions of a Lens*, Van Kets designs "an experimental case study to find evidence of the role of cinematography in the creation" of empathy, or aesthetic appreciations of the viewer with filmic artefacts (2018, p. 237). Psychology research methods play a crucial role when she evaluates the responses from the audience. Costa, anticipating the difficulties of differentiating the work from a director and that of a cinematographer, forms focus groups and questionnaires to answer to questions of unique contributions from cinematographers (2019). Their rationale of integrating methods from psychological studies draws my attention to an emerging paradigm, proposed by Murray Smith who advocates the triangulation concept (2020). In order to gain further understanding of the workings of the human mind, particularly experiencing filmic artefacts as objects of scientific observation, researchers need to integrate three sorts of evidence: phenomenological, psychological, and neuroscientific. Certainly these approaches to dissecting are complementary, not exclusive, as when research identify the mutually supporting intersection, the "consilience – the jumping together" of individually existing bodies of evidence, which can support his or her arguments with stronger credence (Smith, 2022, p. 12). Though psychology and neuroscience alone can not paint a full picture, their methodologies are in effect broadly considered replicable. The key factor that should be put in place is the phenomenological analysis that encompasses and critically engages other sets of accounts, in so doing multifaceted experience of film can be addressed from complementary discourses.

Practice-as-research

Not only manifests itself from the theoretical abstraction and data evaluation, the thick, phenomenological descriptions in critical analysis have been applied in a different methodology route – Practice-as-research. Though researchers are still offering valuable accounts of what a practice-as-research entails, in the UK and Australia, Practice-as-research (or sometimes called Practice-based research) PhD degrees are long-established and recognised by authorising bodies (Nelson, 2022). Colleagues who have published their articles with *Cinematography In Progress*, such as Dr Alexander Nevill, Dr Daniel Maddock and Dr Pavel Prokopic, engaged their research through reflective practices, conducted by themselves in situ. One of the crucial components in their research is portfolio or reflective statement, which offers a mix of written record and work in progress of the researcher's thoughts, recalibrations, and observations during the enquiries. This

chronological evidence allows for a more detailed analysis of the creative decision-making moments, periods, or process. Screenwriter and academic Ann Tobin recalls her journey to PhD in Filmmaking via screenwriting craft, resonating this method – diary or developmental journal:

In this way the research programme, a practice based programme, will hopefully be replicable. It will provide strategies, examples, an understanding of process, that future writers and screenwriting teachers can draw upon, use as a replicable method, and further develop.” (Anderson and Tobin 2012: 954).

Their research approaches to analysing documentations are diverse, and can formulate comprehensive evaluation of how it works and why it works of their research endeavours. Essentially, their research provides a detailed roadmap that can guide other researchers through their valuable experience if further relevant investigations are to be conducted.

In addition to abovementioned two strands of research traditions, other PhD theses, elaborated through different focuses, tackling questions in great depth and with rigors. For instance, Alexander Boutellier builds upon extensive interviews with practitioners worldwide in the trade to contextualise his own practice throughout a feature-length film production (2020); Philip Cowan, utilising close textual analysis to scrutinise a cinematographer’s authorship in films (2016); Jakob Isak Nielsen, extravagating and exemplifying the functions of camera movement through extensive literature review and comparative studies (2007). There are, and will be more and more cinematography researchers producing high-quality outputs, particularly cinematographers nowadays are required to be equipped with skillsets that facilitate a complicated digital workflow. In responding to the conference theme: Virtual Cinematography, I would like to move on to the next discussion that might be useful for Virtual Production (VP).

Cinematography in VP

VP has become a ubiquitous production method for achieving high-quality film, television and media content (Bennett et al., 2021), while a range of technological solution providers race to gear up for training, recruiting and delivering, in an attempt to promote their establishing workflow, such as Mo-Sys and Final Pixel. It is clear that the primordial advantage of VP are real-time capacities of Game Engine applications and rolling up a traditionally linear production departmental model into a dynamic, iterating, but reciprocal relationship. VP Supervisor, a new player naturally in demand on a VP set, plays crucial role in offering choices in technical solution, healthy communications, advices concerning budget and workflow optimisation, and reassurance for final deliverables that entail mutual understandings amongst VFX, Art, Camera and Assistant Director departments. Cinematographer, director and VP Supervisor Kathryn Brillhart states that when the director feels supported and informed regarding the strengths and limitations of VP, she or he can navigate through challenging situations and make better decisions “under pressure on set to prioritize getting the shots needed” (2023, p. 35)

This delicate team relationship has been observed when digital assets such as CGI and VFX contribute to the film productions, if not less potent. Cinematographers need expertise to ensure the shots to be workable down in the production pipeline, meanwhile their skilled vision, approved by the director, leads his/her crew to accomplish artistic representations in frames that consist of both virtual and physical elements. In a feature film production scale, i.e. when departmental hierarchies and crew configurations are relatively clear, the creative inputs from a cinematographer that directly attributes to the successes (or failures) of moving pictures seem not to be questionable. Cathy Greenhalgh contextualises the aesthetics of organization and aesthetic leadership, concepts encapsulating the influence of cinematographers on a film production that aspires mutual trust and efficiency amongst colleagues in an interdisciplinary, performative, interactive transformative and processual activity – filmmaking (2018). This polymathic and mobile dynamic, based on knowledge and loyalty, inevitably relies on on-set collaboration and coordination across members of crew in distributing and acting on information appropriately. Cinematographers become a critical point in the chain of command and are responsible for the quality of the film. This positioning, I argue, maintain a simpler research scope on cinematography in VP, as we can question and examine the

VP functions and how they interact with the departments that are supervised or agreed upon by a cinematographer's vision. However, Greenhalgh's approach to research still obtains a critical evaluation of the role in which cinematographers play with regard to the aesthetic choices. The published rhetoric and anecdotes on individual DP's achievements are not systematically examined by academic research yet, and probably they only are repeated in industry reports because those discourses can promote the "latest technologies and equipment manufacturers, fashionable tropes and professional habits" (2018, p. 212). This means that the real revelation of advance in ground-breaking innovations might not be always the case.

Considering the inherent challenges i.e. whether research can resort to industry reviews, talks, and the latest hype, I propose a model that could be utilised for expending empirical examinations - System model of creativity development, in that creativity is a process that can be observed only at the intersection of individuals, domains, and fields. Yeh states that "individuals draw on information in a particular domain and transform or extend it through their cognitive processes, motivation, or unique life experiences" (2011, p. 293). Cinematography in VP can be understood as an open domain that communicates and even dictates how artists in charge of optimising virtual environment to co-create the images. By setting up research parameters according to the system model, the contributions derived from the cinematographer can be identified and supported. Cinematographers are, essentially creators. If we regard cinematographers as the guardian or engineer of the images, amongst other heads of department, the genesis of their creativity should be foregrounded and dissected in a structured fashion for consolidating the work of cinematographers.

Joined force in Research & Development of VP

Now, I would like to introduce another trend of Research & Development in the UK that explores the potentials of VP. The speed and scale of R&D; in VP technologies are impressive, however I argue the models of research in academia are gravitating towards the 'applicability', whereby finding solutions to specific production potentials is prioritised. StoryFutures Academy at Royal Holloway, University of London and National Film and Television School (NFTS) together, deliver VP training and research opportunity, in that academics and Small-and-Medium sized enterprises (SMEs) join force to solve targeted practical challenges encountered in the field through early-stage prototypes (StoryFutures Academy, 2022).

The School of Arts and Creative Industries (ACI) at London South Bank University has also collaborated closely with SMEs as its flagship Research and Enterprise project – Hi3 network. Similarly to StoryFutures, in addition to free access to high-tech creative facilities, studios and working spaces, academics who are associated with Hi3 Network are paired with SMEs, if businesses are interested in using VP for their proof of concept, product prototype development, or workflow research, in an attempt to catapult new business growths (Department for Business, Energy & Industrial Strategy, 2021). Working with studios that are equipped with VP facilities, ACI liaises academics and SMEs to advance together on shared R&D; agenda. Their work also include the education, training, and networking, in order to foster an active and vibrant communities. Hi3 was funded by the European Regional Development Fund, and hopefully will continue. Needless to say, the enthusiasm of VP supporting businesses to thrive is positive and visionary, as the creative sector alone contributed £104 billion to the economy in 2021 (Smith, 2022). I propose that the research on creativity of a cinematographer should advance in parallel with the technical improvements in VP.

Questions to be answered

After painting a bright picture, I would like to point out a missing puzzle in the current VP trend - decolonising research initiatives. I suggest that researchers in Cinematography should pay heed to the under-presentation issues at the stage of conceptualisation; we should also question the inclusiveness in research samples. In drawing a concerning comparison between the early Internet and VR zeal, Nakamura points out that both technologies involved "high-cost equipment, limited usage, and target audiences as well as developers and users who were predominantly white men";

this risked the disavowal, obliteration, and marginalisation of non-white and non-male race and gender identities (2019, p.51). VP is similarly lauded as a technology of the future while its versatility and potential ubiquity is emphasised. I propose that research on VP that focuses on technological advancement and technical design should be critically appraised from decolonial perspectives. My previous articles tackle lighting strategies (Sung 2020), aesthetic education and how certain Eurocentric conventions need to be revisited when working with a wider range of skin-toned models and incorporating other aesthetic traditions (Sung 2022). As they only touched upon basic practices in the training of a cinematographer, naturally there are more taken-for-granted praxes waiting to be examined with decolonising methodologies. With the awareness of diversity and inclusion, cinematography in the VP trend is evolving in a different context. New technologies are designed to solve the previous shortcomings, and arguably do not rely on light skin complexions as a universal and default standard. For instance, Image-based lighting synchronises LED outputs for matching the environment, which creates authentic ambient light to enhance the (Quasar Science, 2023); facial capture systems such as Medusa software, capable of per-frame dynamic appearance that can process data to represent blood flow and realistic light reflections on the skin of virtual characters (Vilchis et al., 2023). I argue, as researcher-practitioner, we need to continue various achievements thus far while critically engaging with our relationship between creativity, technologies and the potential biases towards less-studied ethnic groups, so we can leverage the advancement in equipment and maximise our research potential with it.

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