

A Case Study of Assignments Through an Online Mentoring Program

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Abstract

Behind ubiquitous information in the 21st century is the desire for understanding and mastering the information. As with any application-oriented learning method, it is necessary to truly appreciate its domain before mastering its core knowledge and applying it flexibly in practical operations. Student hands-on exercise is a commonly used teaching model across all disciplines in today's higher education, and this mode of learning has also been deeply engraved in the hearts of students. However, there is a potential crisis here, that is, blindly pursuing practical operations and ignoring primary education in such a field and the promotion of competency. This problem is particularly prominent in highly practical subjects, such as film visual effects, which not only require a solid understanding of film language and software skills, but also logical thinking ability to cope with the needs of dealing with digital images, colors, natural light, physics and mathematics, and production pipelines in the high stand contemporary film industry. Thus, an in-depth understanding of the big picture in the subject and its standards before getting hands-on is essential for students' learning. This paper is to showcase a hybrid course assignment and distribution through an externally funding project - the VFX Online Mentoring Program, which was supported by three Academy award-winning visual effects studios and 6 UK higher education institutions with a total of 88 participating students. Additionally, as an extended project, the program is currently open to undergraduate students of all levels and disciplines in St. John's University, New York.

Keywords: Online Mentoring, Visual Effects, Industry Pipelines

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Introduction

In today's society, competition is fierce in all walks of life. In order for entering the area that students have dreamed of, they are actively preparing all the necessary skills and knowledge for their future. It is no exaggeration to say that today's university graduates are in such fierce competition as in an invisible "workplace war", which impacts all disciplines, including highly practical subjects. Film visual effects require broad knowledge across multiple disciplines and solid technical skills in operating those industry-standard applications. More than that, the film industry standards are also set very high. Without understanding the industry standards and requirements, graduates can hardly even find entry-level positions in the visual effects industry. As educators, this is no doubt a reminder that we not only need to equip our students with the hard skills required by the industry, but also the soft skills they need to develop for future professional development.

Sun Tzu - An ancient Chinese strategist once said that if you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle (Gagliardi, 2014).

Over the past three decades, computer-based effects have transformed the way high-end films are made. Today, the visual effects industry is very well established in the US and the UK. As one of the typical iconic representatives in the motion picture industry, Hollywood blockbusters and the U.S. film industry can be seen as the driving force behind the global film industry. NextGen Skills Academy (Livingstone and Hope, 2011), U.K information of professions examined that the visual effects budget has proportionally grown from approximately 10 percent to a maximum of about 50 percent in recent film productions. From fascinating sci-fi scenes to classic narrative stories of Hollywood films, it is hard to imagine a Hollywood blockbuster over the last decade has not benefited from the creative expertise visual effects. Data from research firm (Dergarabedian P, 2018) reveals that the 2018 summer North American box-office figures broke a record with a U.S. domestic total of \$4.8 billion, suggesting box office and streaming are synergistic. All ten of the 10 highest grossing films in the U.S. were either VFX movies or computer-animated films, and many of the most popular streaming shows were also VFX heavy.

Although many world-class visual effects companies are the U.S. and U.K. based, higher education in this field is not as successfully established as the thriving industry. NextGen (2011) states that the industries suffer from an education system that does not understand their needs. In addition, the NextGen has also claimed that there were already many universities courses purporting to provide specialist training for video games and visual effects, but most of these courses flawed, eventually leaving those graduating from them with poor job prospects. Due to the current status of higher education in film visual effects, film visual effects facilities struggle with the lack of finding qualified new graduates. As a long-term impact, visual effects companies have to recruit skillful artists from overseas. The U.S. Citizenship and Immigration Services (USIS) has indicated visual effects occupation on the O-1 and O-2 visa applications; the U.K. Home Office has also listed visual effects on the U.K. Shortage Occupation List.

VFX online mentoring program design concept and implementation

The following sections aim to demonstrate a case study of the VFX Online Mentoring Program (Website) that opened for 88 undergraduate students and their course leaders from six UK HE institutions in 2017. As an extension of the project, the VFX Online Mentoring Program 2020 (Website) is currently open to undergraduate students recruited from film production, 3D animation, computer science, communication design and art majors at St. John's University, New York.

Key design concept

Biggs (2003) states that "Learning is constructed by what activities the students carry; learning is about what they do, not about what we teachers do." As a critical reflection, I partly agree with this view. The notion of student-centered teaching is the right direction to go, and we should provide students with a good learning experience. However, this does not necessarily mean educators should be entirely driven by students. Nowadays, employability is one of the main aims in many universities, and the industry standards in film visual effects are very high and defined explicitly by the industry. However, students are not necessarily clear about this. It may be a potential danger if we despise what teachers do and drift along purely by students on their learning path.

VFX Online Mentoring Program is a hybrid training program, which contains a series of online and in-class sections in one semester, including online live session and in-class hands-on tasks. The program aims at in-depth knowledge of film visual effects productions, pipelines, and in-studio team collaboration and external peer cooperation. As an additional online learning and supporting platform, the program runs parallel to three other in-class VFX relating courses in our institution, thereby we can effectively combine the two teaching platforms seamlessly, so as to maximize the combination of theory and practice of the courses. The ultimate purpose of the project is to foster collaboration between the university and industry and help our students to maximize the learning of the subject.

Although the funding project is intended for teaching purposes, if it has been considered as a research project at the program design stage, we will naturally generate a series of questions about the course development, and motivate us to find corresponding solutions that eventually lead to defining assignments and learning outcomes and inspire students to be "actors in the learning process" (Bain, 2004).

Sequence assignment is one of the common ways of course assignments. At the planning stage, the instructor should think about the order of assignments to build skills in a logical sequence. Armstrong states that students benefit from sequencing: completing assignments that build on one another and culminate in a substantial project (Armstrong, 2019).

Learning outcomes

Learning outcomes should be measurable in terms of timing and course achievements. The instructor gets students to exercise their imaginations while also accomplishing the learning objectives of the course.

By the end of this program, participating students will be able to:

1. Recognize the visual effects industry and standards, pipelines and workflow.
2. Make effective use of problem-solving in terms of on-set and in-studio visual effects operations, implement and evaluate give tasks scientifically and creatively.
3. Work on VFX tasks collaboratively and take responsibility for meeting deadlines and demonstrate a synthesis of the theory and applications.
4. Create high-quality VFX shots and demonstrate the necessary technical breakdown efficiently in demo reels.

VFX online mentoring program assignments

The project has been direct support by three world-leading VFX facilities: The Moving Picture Company (MPC) London Headquarters; Framestore Visual Effects London Headquarters; (Oriental) DreamWorks (Shanghai). By providing detailed information about inner-workings of VFX Facilities, including VFX pipelines, standards, VFX roles and operational collaboration between departments, etc., the program covered a series of valuable professional information. Through this learning opportunity, participating students have gained in-depth knowledge and understanding of how VFX facilities work and hard skills and soft skills required by potential employers.

Assignment one: pre-recorded online self-learning videos

The program participating students and their course leaders can access up to 27 exclusive pre-recorded self-learning videos that covered a series of critical stages of visual effects production pipelines and operations inside world-leading VFX facilities, including departments and VFX pipelines, concept art, VFX editorial, rotoscoping and cleaning plates, match moving, matte painting, 3D layout, previsualization, 3D animation and modeling, FX, technical director, lighting and look development, VFX supervisor, 3d rendering, compositing, VFX producer, VFX recruitment (Video Examples). All pre-recorded videos have included a unique type of VFX productions. MPC videos focused on VFX in high-end feature films. Framestore videos demonstrated not only VFX in high-end feature films but also VFX productions in TV commercials. (Oriental) DreamWorks videos showed a number of critical tasks for 3D animated feature films. The different types of themes gave learners an excellent opportunity to compare how various VFX productions are operated in large-scale VFX companies.

Assignment two: online Q&A sessions

An online live Q&A session was scheduled at the end of each learning week (Live Session Examples). In 2017, we invited 15 senior professionals, including Head of Departments from MPC and Framestore to answer potentials questions that participating students might have based on the learning contents of each learning week. Students could directly ask specific questions and instantly receive answers from participating professionals and artists via Adobe Connect. The online Q&A sessions provided an excellent opportunity for all students to engage with the program interactively. Additionally, all Q&A sessions were recorded and available on the program's official website to all students who were not able to attend the live Q&A sessions but watch the recorded Q&A videos at a convenient time.

Assignment three: hands-on projects

The in-class assignment has included 2D and 3D tasks.

Team allocation

Participating students were grouped up, and each group contained 5 to 6 students. Although participating students are from various disciplines. We ensured each group to maintain two students, who are film production-related majors, one of them was appointed as a group leader to take responsibility for comprehensive team management and relating tasks of the team.

2D VFX work concept and tasks

Group members of each group shared a live-action plate, which picked up from an old black and white movie. Each group would design a shot matching lighting, camera perspective, interactive action details with the movie footage, and seamlessly integrate a new character filmed in front of a green screen into the live-action footage.

2D tasks were aiming at green screen filming and compositing. Operating tasks required group work, including brainstorming, team collaboration, shot analyses, lightmap creation, in-studio filming, on-set data collection, and individual work, including rotoscoping, clean plates, green screen keying and final compositing.

A 2nd year undergraduate student work example:

[2D VFX work example]

3D VFX work concept and tasks

In accordance with the concept of 2D VFX work, 3D VFX work follows the similar concept but location shooting. 3D VFX work was focusing 3D CGI on seamless integration with live-action footage. Each group can pick up different locations and design their unique shots. Group members of each group share the same live-action footage and on-set data information, including camera data, lighting setup and HDR image captured during filming.

3D tasks on-set filming required group work, including on-set live-action filming, lens grid filming, camera lens data collection, on-set photogrammetry and HDR image capture, etc. Individual tasks for each group member included camera match moving, 3D character design, modeling, lighting simulation, texturing, camera match moving, animation, rendering and final live-action compositing tasks.

A 3rd-year undergraduate student work example:

[3DVFX work example]

Assessment strategies and coursework feedback

Due to the nature of e-learning and in-class learning, students' assessments in this program can be challenging. As far as online learning is concerned, Watson and Sottile (2013) claim that while it's not clear whether online students do, in fact, cheat more than face-to-face students. Indeed, online learning is more difficult to regulate than in-class learning. The strategies for adapting assessments for each student in this project include: Part one: an online exam, students are required to take the online exam in class.

Part two: an individual practical submission.

The online exam accounts for 50% of the total score, and the actual practice submission accounts for another 50%. In addition, the practical submission assessment criteria are subdivided into five scoring categories, which are shown as follows:

- Team Collaboration (5%);
- Individual (VFX) Shot Design (5%);
- 3D Assets Creation (15%);
- 2D & 3D CGI Compositing (15%);
- Shot Analyses (10%);

Figure 1 shows the integrated assessment details for the VFX Online Mentoring Program and an in-class VFX course.

Assessment Categories		
VFX Online Mentoring Program (online) VFX3209: Film Visual Effects Principles (in-class)		
Assessment Categories	Score Distribution	Student Score
VFX Online Mentoring Program (Online Exam)	50%	?%
		+
VFX 3209: Film Visual Effects Principles (Practical Submission)	50%	
Practical Submission Assessment Categories & Score Distribution		
Team Collaboration (on-set & in-class)	5%	?%
Individual (VFX) Shot Design	5%	?%
3D Assets Creation (professional problem-solving approaches & final quality)	15%	?%
2D & 3D CGI Compositing (Scientific understanding of the digital images & Professional problem-solving)	15%	?%
Shot Analyses (on-set report & creation analyses and implementation)	10%	?%
Student Final Total Score		?%

Figure 1: Shows the assessment category details and score distribution in each category

Assessment and coursework feedback are inseparable from the course assignments. In many cases, I use a mixture of two approaches giving student coursework assessment feedback. Written feedback and video recording feedback:

Written feedback can provide a clear and logical description of student learning performance and progress. Video recording feedback can quickly provide a clear visual indication of errors in practical coursework submissions. Due to the heavy use of professional applications in our subjects, video recording feedback can prevent unnecessary confusion and lengthy written feedback for demonstrating issues in each student's coursework.

Sustainable learning

After completing the program, participating students are still able to access the project online data system and all videos, including recorded Q&A sessions until they graduate. This allows students to reference and refresh the knowledge obtained in this project. Overall, the idea and approaches experimented in the VFX HE Online Mentoring Program are fully adaptable and can be utilized in similar higher educational subjects across different countries.

VFX HE Online Mentoring Program learning contents can be seamlessly embedded into a series of internal VFX courses at participating institutions. The project can be opened automatically to undergraduate 2nd and 3rd-year students in film, animation, art and design majors.

We believe the project online learning system can provide a valuable background learning platform for our students.

In addition, all participating academics (course leaders) from HE institutions also can freely access the project learning data. As educators who have a direct impact on many aspects of students, we hope that the voice of the industry can be passed directly to these course leaders in order to promote their continuous improvement in the construction and development of related subjects.

Conclusions

Today's modern film and game industry are getting more complicated than ever before. Visual stories that represented to audiences through media platforms are the results of the collective effort of teamwork. Production pipelines play a critical role in balancing production quality and efficiency. For students, "understanding how production pipelines work increases their chances of employment. One of the most common failings of interviewees is lack of understanding of the production process" (Dunlop, 2014). Visual effects and 3D animation in higher education at the university level traditionally covered creative education as well as software and technical training. However, artists require a solid understanding of production pipelines and in-depth education in scientific factors, especially in high-end feature film and TV commercial productions in order to efficiently deal with various assets from colleagues, teams and departments in daily production work. The lack of education in these critical factors about VFX productions leads a large number of students trapped into a situation of focusing on fast-updating software and eventually became skilled operators, rather than a creative artist with a critical mind. As academics, we probably should think about whether this is what we expected from our next generation.

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