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EDUCATIONAL VIDEOS ON SUSTAINABLE DEVELOPMENT

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ABSTRACT

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The result of this thesis produces visual materials in this aspect to guide students and staff members on how to act eco-friendly. On the technical side, it contributes theoretical concepts and practical examples on shooting a short movie from pre-production to post-production.

To complete this paper, knowledge on environment conservation and video making techniques are developed. The information is gathered from the section of sustainable development from OUAS' website and intranet. On video-making techniques, books and practical experiences through implementation are the main resources.

The process of making short movies is carried out from March until the end of May 2014, with the use of movie editing software such as Adobe Premier Pro and Adobe After Effects. Cameras and necessary equipment are supported by OUAS laboratory. Edited parts have been temporarily stored in OUAS' hard drive until the full movies are completed.

After the movies are done, a link will be added to OUAS intranet, section of sustainable development, so that everybody can access them easily. Also, they are available from the author's Youtube channel. The final videos are not only used in Green Thinking course, but in other classes as well, for example in Video lectures.

CONTENTS

1 INTRODUCTION

In Oulu University of Applied Sciences (Oulu UAS), sustainable development attracts a lot of attention. One of the development strategies involves the education of effective use of resources. The concern about this topic results in its integration into academic courses (e.g. Green Thinking), programs to save energy, relevant documents and reports on the school's website, Ykä-koira image as an environmental representative, and theses with clear sustainable development criteria. This thesis contributes to the development of sustainable development teaching with visual materials on how to act eco-friendly, in which environmental conservation serves as the core content to go further with the technical section: making short movies. At the end of this work, four videos of five minutes per each will be produced to support the educational purpose. The movies, hopefully, will help present green activities in a more dynamic way than documented papers do. The idea of this work is credited to Ms. Minna Kamula, an Oulu UAS senior lecturer and member of the sustainable development team in the School of Business and Information Management.

The written document is divided into two parts: the first section reports sustainable development in Oulu UAS including its policy and implementation; the second part deals with the concepts and practical techniques that pertain to short videos production, in which numerous elements are required to create a successful movie. Although it depends on how the producers want their films to be as an artwork or entertainment work, movie production normally goes through the preparation step (developing ideas, script, story board, filming equipment), the production process with video recording elements (using camera angles, sound, lighting) and the post-production step (editing the movie sequences by working with movie editing software). Throughout this section, practical examples from the author's process of filming will closely interweave with the theoretical concepts accumulated from other resources. In other words, illustrative images or shots in this paper will be taken mostly from the author's videos.

As this is a type of work development thesis, the author focuses on the process of doing and its demonstration based on her own experience. The question to answer here is: "how to make a short movie", or "how to feature one idea well in a five-minute video". Finally, the answer will be worked out with real products.

One of the literature resources is "The Five C's of Cinematography" by Joseph Mascelli, in which five influential elements namely camera angles, continuity, cutting, close-ups and composition are each introduced in one separate chapter. This book does not talk about the process of making films, but rather provides an understanding of what makes the perfection of a movie, so that the director should invest more time in featuring those elements. For example, it recommends when to use a long-shot scene, when to close-up the character's face, and how to place the camera to help the viewer become involved in the emotions of the character, and so on.

Another book that can be taken into account is Peter Rea and David Irving's "Producing and directing the short film and video". This especially illustrates the phases of film making, such as writing and breaking down the script, setting the crew, casting, editing sound effects, etc. Another piece of literature, "Film directing shot by shot - Visualizing from concept to screen" by Steven Katz, concentrates on visualization elements of pre-production, such as sketching story-board and featuring shots. And the list goes on.

Since filmmaking requires much of practicalities, the methodology emphasizes gaining the knowledge through personal practice and experience. Furthermore, consults with teachers on the use of filming equipment and software are much appreciated. Cameras, tripods, and software are borrowed from Oulu UAS. Besides, books and theses on cinematography effectively support the base of theoretical framework. Finally, the Oulu UAS sustainable development section serves as an important resource channel to gather information on its policy and implementation. The resulted videos will then be uploaded to the Internet and stored in the school's hard drive for easy access. They may also be accessible through the school's intranet with a link. The Oulu UAS, as well as the author, has the full copyright to use and distribute all these videos.

2 SUBJECT CONTEXT

Being the theoretical base for the videos' content, sustainable development is discussed in this section to provide an overview of the subject.

2.1 Sustainable development

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This definition comes from Our Common Future: Report of the World Commission on Environment and Development (United Nations, Date of Retrieval 15.04.2014). In accordance with this concept, there is a sustainability in daily operation when it fulfils both present and future needs. This does not simply mention the preservation of current resources and savings, but also motivate innovations that prevent people from relying too much on one means to meet their current needs.

In human life, natural resources play an indispensable role, but the way they are used can be regarded as a two-edge knife. Crude oil is an example. Firstly, on one hand, people need oil to make gasoline or aviation fuel to run cars, planes, machines, and so on; on the other hand, cars generate carbon dioxide which causes air pollution. So far, oil does not directly destroy the human lungs, but if everything is seen in connection, people are somehow shooting their own legs. Secondly, crude oil as well as many other natural materials, is a finite resource. Sooner or later they will become scarce commodities. Thus, the role of sustainable development is significant in finding safe ways to ensure the standard of living and quality of life now and in the future.

Society, economy, and ecology establish three pillars of sustainability (The Truist Blog, Date of Retrieval 15.04.2014). Social sustainability concerns about people and human rights by balancing the relationship between individual and community and maintaining a cohesive society, e.g. welfare, gender equality. In line with the Western Australia Council of Social Services (WACOSS), a community is socially sustainably developed when it is "equitable, diverse, connected and democratic and provide a good quality of life" (Hodgson, Date of Retrieval 15.04.2014). Economic pillar indicates that the resources should be preserved efficiently to produce long-term benefits and profitability; it also advocates local business development and

criticizes heavy consumption. Overall, economic sustainability ensures and prepares for the healthy and stable growth of a company, a nation or an entire business region. The last dimension concentrates on the protection of environment, for example reduction of carbon footprint and deforestation, promotion of renewable resources, organic farming, recycling, waste management, etc. (Yayadrop, Date of Retrieval 24.04.2014).
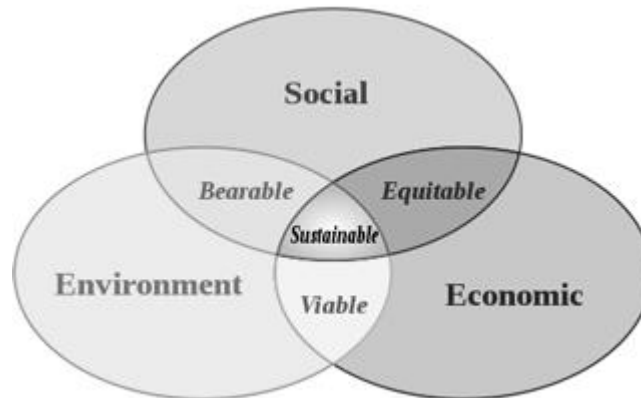

FIGURE 1. Three pillars of sustainable development (Wikipedia, Sustainable development.svg, Date of Retrieval 08.10.2014)

The three circles of sustainable development closely intervene, depend on one another and equally contribute to the same goal, although they differ in their own aspects and roles. According to Teodorescu, sustainable development topic encompasses all three parts. They should not be seen as single elements, but rather as a system form that needs to be kept in balance. Because of their close-knit relationship, on the one hand, an activity can benefit more than one aspect. For instance, by bringing down the amount of greenhouse gases, both human health and environment will become better, which affect both social and ecological sides. On the other hand, if too much attention is paid to one side, the others may get downgraded and the state of sustainability as a whole will be at risk. As an example, Teodorescu proposes that there should be a reasonable price that everybody can access for energy services. This blurs the line between poverty and wealth, urban and rural areas regarding the right to use electricity. In addition, this restricts the use of candles, which results in air pollution. (Teodorescu, Date of Retrieval 04.05.2014.)

Sustainable development remains a prominent topic on the global forum. Environment degradation which leads to climate change, as well as current and potential damages to human

health and wildlife, is what humankind are dealing with at the moment. The culprits involve greenhouse gases such as water vapours, methane, carbon dioxide from auto-vehicles and the burning of fossil fuels; excessive energy consumption; extreme exploitation of natural resources, and so on. For example, global warming causes ice melting, and water from glaciers raises sea levels, which leads to sand loss and potential disappearance of islands such as Maldives (Yle Areena, Date of Retrieval 24.04.2014), Great Barrier Reef in Australia (Agence France Presse) and other detrimental effects on the coastal ecosystem. Along with the increased temperature of the Earth, considerable amount of animals that live in cold climate condition like polar bears will face the threat of extinction. Likewise, it will get increasingly difficult for human to deal with floods, droughts and other natural catastrophes.

To remedy the situation, the resolutions in discussion are about resource preservation for the next generations, including purifying earth, air, land, water and protecting thousands of extant animal species, in ways that should not completely destroy quality of life. New technologies have been developed, for example powerful machines with less energy consumption (Energy Star products); renewable energy such as solar and wind power to replace conventional fuels; bio-based products such as bio fuels to make use of renewable resources, etc. But mostly, human's awareness of their actions should be raised, and changed. Can people reduce the use of digital devices in order to save energy? Can they use bicycles instead of cars to decrease the amount of carbon dioxide emitted into the air every day? It may be difficult to permanently alter their habits, but the chance is higher if their environmental awareness is raised in smarter ways. In this case, the role of educational media is the key element.

2.2 Environmental sustainability in Oulu UAS

Oulu UAS, like other universities of applied sciences, cares about sustainable development and its implementation. The school has documented its own official policy on environmental issues, based on the instructions from Oulu Region Joint Authority for Education as well as environmental legislation and regulations from authorities (Oulu University of Applied Sciences, the environmental policy of the school of Business and Information Management of the Oulu University of Applied Sciences, Date of Retrieval 14.03.2014).

2.2.1 Policy

Oulu UAS aims at yielding "environmentally conscious graduates", which suggests the sustainable development principles be included in the curriculum together with other professional courses. The school's objectives includes ecological, economic, social and cultural responsibilities. Specifically, programs and events that emphasize this topic currently are embedded in teaching development, Research Development Innovation work, integration of this in daily routines, and communication potential to promote sustainable development as "quality politics and culture of Oulu UAS" (Oulu University of Applied Sciences, Sustainable development programme of Oulu UAS, Date of Retrieval 14.3.2014).

As stated in the school policy, "the most important environmental objective is to increase awareness of environmental issues among the staff, students, local business and working life. Other essential environmental objectives include decreasing energy consumption, use of paper and the amount of waste" (Oulu University of Applied Sciences, The environmental policy of the school of Business and Information Management of the Oulu University of Applied Sciences, Date of Retrieval 14.3.2014). Thus, the UAS provides instructions on environmental guidelines, waste management and recycling, motivates related projects and events, and annually reports on implementation.

For theses on the topic, the assessment framework involves the four mentioned responsibilities, the first three aspects bear resemblances with the three pillars of sustainable development in the previous section, whilst the last one introduces the sustainability in culture and communication process, which targets multiculturalism, internationalization, professional dialogue, local cultures and tolerance. These also set the criteria for evaluation (Oulu University of Applied Sciences, Assessment of theses of sustainable development in Oulu UAS, Date of Retrieval 14.3.2014).

2.2.2 Implementation

To improve awareness of people, programs and events such as "Sustainable development as a part of the competence 2015", "Take it or leave it", "Energy saving week", "International Week", "Global Responsibility", and so on are organized. With regard to documentation, environmental guidelines involves instructions on consumption of paper, energy, and water; waste management

in office; and introduction of eco-label. The school also encourages traveling by bicycles and reducing the use of cars or flights to limit carbon dioxide emissions.

As several academic curriculums also joins the movement of sustainable development promotion, Green Thinking course in which students are grouped to find green solutions for visiting companies, then present them in front of the commissioner, teacher, and other students is arranged as compulsory course.

Classification bins for different types of wastes can be found in classrooms and corridors. In the corridor, waste bins are separated to contain bio-products, glass, small metals, and burnable wastes. There are only two bins inside the classroom to classify burnable waste and paper, and one carton for cardboards. Hazardous waste such as batteries must be brought directly to the janitors. Waste sorting guidelines can also be found on Oiva - the school's intranet and on the billboard out at the corridors (Oulu University of Applied Sciences, School of Business and Information Management environmental guidelines, Date of Retrieval 14.3.2014).

Annually, there are reports on the use of energy and the amount of paper and waste within school areas. Those reports provides an overview of material consumption of the entire year in comparison with the previous year (Oulu University of Applied Sciences, Sustainable development bulletin, Date of Retrieval 14.3.2014).

Figure 2 illustrates the use of electricity, district heating and water in Oulu UAS in 2013 compared to 2012. As can be seen, there was no major change, except a slight increase in the use of water. Regarding electricity and water consumption, the peak of the first nine months of 2013 fell on January, February and April with approximately 70,000 kWh (electricity) and 320,00 m^3 (water).
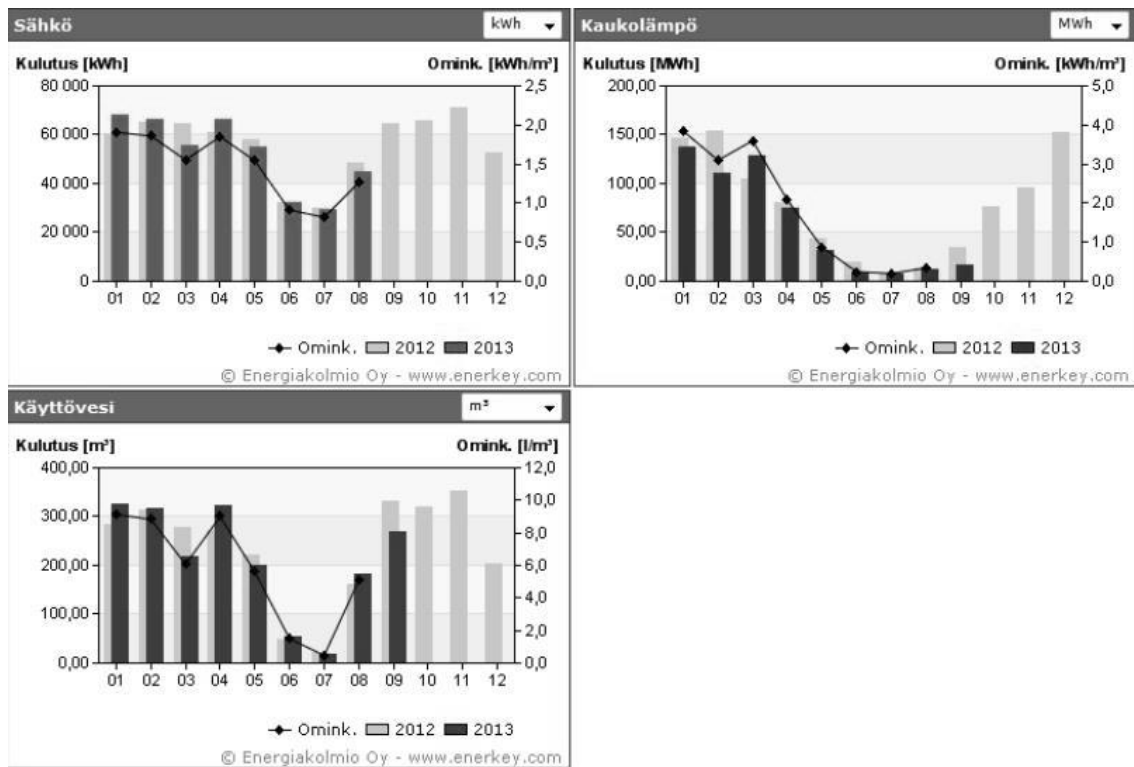
FIGURE 2. Information on energy and water consumption in Oulu UAS in 2013 (Oulu University of Applied Sciences, Date of Retrieval 14.3.2014)

As a result, previously, Oulu UAS achieved Green Office diplomas in ecological footprint reduction for Library, Vocational teacher education, school of music, dance and media, and Rector's office. At the moment, environmental standard certificate ISO 14001 is granted to the schools of Health and social care, Business and information management and Renewable resources for their effective work in ecological management. Nowadays (September 2015), the unit of Renewable Resources is a part of the School of Engineering and Natural Resources. (Oulu University of Applied Sciences, Sustainable development programme of Oulu UAS, Date of Retrieval 14.03.2014.)

Figure 3 is YKÄ-koira, Oulu UAS's representative of sustainable development. This avatar has been embedded as a sign/logo in documents and posters related to this issue. Also, it will be the logo throughout this project's videos.

FIGURE 3. YKÄ-koira - the representatives of sustainable development in Oulu UAS

2.3 Transform the concepts into videos

Due to the large scale of this topic, there exists a challenge in transferring the concepts into short videos. The type of videos is decided to be educational videos. The chosen topics involve air pollution, green use of computers, recycling and reuse. The air pollution video emphasizes on the generation of methane and carbon dioxide as heat-trapping gases that are involved in global warming. The video of computer green use illustrates the methods of using digital machines in an eco-friendly and economical way. Likewise, recycling scenes are completed for another how-to video about waste classification and the correct use of the trash bins. The last product will mention several ways for students to reuse their materials, based on the event "Take it or leave it" which encourages recycling and light consumption.

Because of the interdependency among the pillars of sustainable development, the delivered messages that seem to pay more attention to the ecological and economic sides may also imply social impacts. Most of all, the main intention focuses on environmental conservation.

3 PRE-PRODUCTION

The pre-production plays a key role in the development of a video project. This phase does not only prepare camera and tripods, or ideas and concepts in details with manuscripts, but also includes storyboards, and other materials to help visualize the flow of content shot by shot.

3.1 Generation of idea and concept

There would be no film without ideas (Gates 1999, 4). The original idea may be evaluated and changed later based on budget and the market. To the entire movie, the idea serves as the root of a tree, from which growing branches and leaves. Featured details can be later developed to emphasize the core, but above all, it needs a starting point. For this project, the topics of the movies have been decided to be re-using, waste management, green computer use, and air pollution reduction by eating less meat and resisting travelling by car or airplane. The supporting ideas were generated surrounding those topics. They have been found in many ways, from one people's real experiences and from books, magazines, and Internet. The growth of Internet has made knowledge much more accessible to everyone. Although the accuracy of the information needs to be evaluated, the access to the mind of millions of people also plays an important role in expanding the videos' content. For example, the methods of how to make use of unnecessary objects in video *Re-use* were taken from Internet, so was the knowledge demonstrated in video *Air protection* and the tips for using computer in video *Computer green use*.

One of the principles that the author applied to this project is positivity. In details, the characters in the movies do not perform any negative activities. The author believes that the audience will remember whatever is showed on the screen. Consequently, if there is a negative incident, it will linger on in the viewer's memory. For example, in order to support the idea of throwing waste into the correct bin, the director can create a "bad" character who always mixes up the trash and then say it is wrong to do so, or he can create a "good" character who puts things into the designated boxes and then say this is the right way. The author prefers the second choice, because it is positive. On the other hand, most students do not like to be showed as villains (unless they can be very stylish villains), so they do not have to lose face this way.

Secondly, the feel and look of the short films were carefully contemplated. For the most part, they were shot mainly in and around OUAS, and in student rooms to make it familiar with students, one of the main groups of audience of these videos. The materials and products from video *Re-use* also benefit students because they are rather necessary and inexpensive. Video *Waste management* mentions only the waste system of OUAS. The last two videos' content is suitable for all people, not particularly for students, but they were also filmed mainly at OUAS.

The third element considered the form of the movies. Generally, footages taken from Video Camera might be sufficient to illustrate the ideas, but having interwoven animation made by computer software is a complementary method, because in some cases, simply animation can speak more than real life's images, and it also avoids tedium of the whole footage. Figure 4 is taken from the mentioned video, with flat icons showing the correct waste types of glass presented in animation.
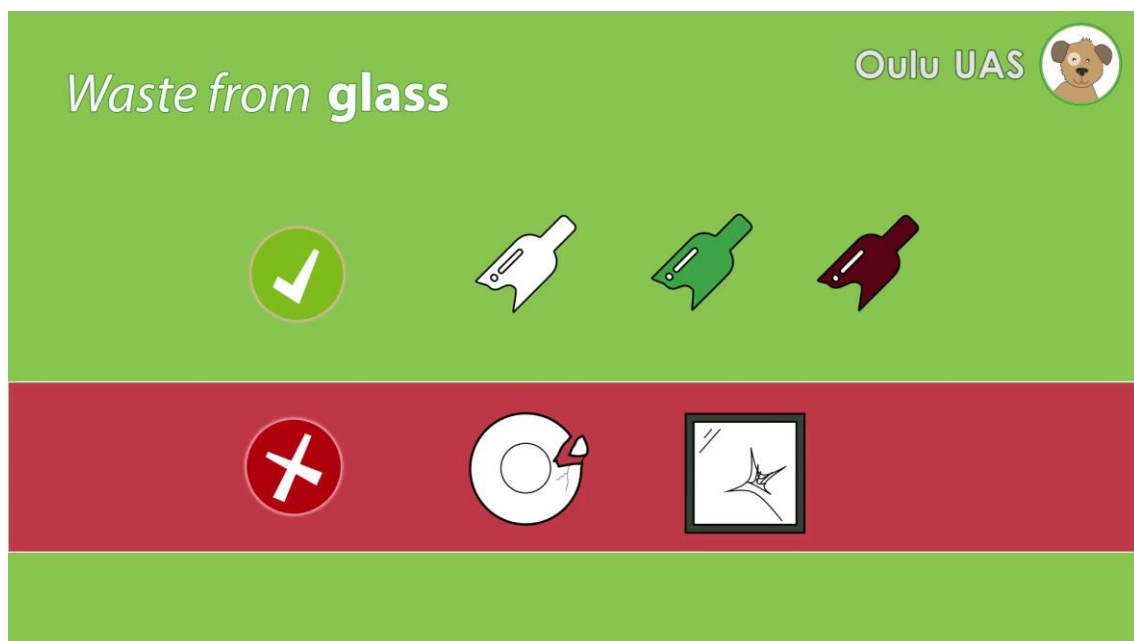
FIGURE 4. A snapshot from video Waste management

The development of these videos followed knowledge requirements. This means, the knowledge to be covered was decided first, then the decision how to present it. Consequently, the flow of the story is more or less predictable and there is no bottleneck or climax such as a fight between a prince and a monster to save the princess like in a Hollywood film. Among those films, only video *Re-use* develops a plot that depicts the process of problem - solution - results. By contrast, the

last video namely *Air protection*, similar to an advertising video, uses most of its runtime and a large number of animated scenes to explain and suggest that people employ greener diets and transportations to protect the atmosphere.

Another factor that decides how the idea is going to be developed is the number of characters. It probably seems unprofessional to decide what idea should be developed for only 3-4 characters, not the other way around. However, in this project, the author did exactly that way, with the anticipation that she would have very limited number of actors in each shot. She found it easier to process, rather than having a plot without planning beforehand how many actors she could persuade to join the project.

3.2 Script

"It all starts with an idea. For that idea to become a film; it must be fleshed out and developed into a script or screenplay...From it, you know the story, the characters, the locations, the approximate budget, the final length, and your target audience.", stated Rea & Irving (2010, 1). A script demonstrates the idea and may also summarize what happens in the film, including elements such as lighting, camera angles, number of actors and actresses, etc.

A manuscript and its related documents such as manuscript breakdowns are magnificent and powerful pieces of paper similar to a business plan, which people can use as an action plan, or a road map and a sales tool simultaneously. Above all, it is also the starting point, the first piece of paper that everybody is involved, from actors to gaffer, should at least have a look at before they actually start their particular jobs. For a definition, Rea & Irving wrote, "A script depicts the moment-to-moment progression of events by indicating what the audience will see and hear". Experience from real life, events, images, dreams, and memories are just five among the sources to develop film content. For example, the author was inspired by "Take it or leave it" before writing the script *Re-use* based on this real event, in which people give unwanted objects to those who need them or remake them into usable properties. Rea & Irving also suggests that the writing should come from the heart and the subject should be based on what the writer already knows. Also, keeping a notebook of good ideas is another method to store details for later development. (Rea & Irving 2010, 3-6.)

The script starts from an idea and evolves, or will be narrowed down as more factors are taken into consideration, e.g. budget and duration. This is when practicalities come into play. A short movie of about five minutes should not have too many details, and a limited budget makes it challenging to launch an idea that requires big investment. Rea & Irving (2010, 12) suggest that only a single event be focused on in a short film, thereby, the prospects of the movie can be fully explored. Regarding the development of ideas into scripts, they recommends that after looking for, categorizing, and storing ideas, the next step should be communicating with other people to "test" the ideas with potential audience, and because "verbalized ideas will be stimulating", speaking them out loud may bring about different influences in comparison with only reading. They also point out that finding a suitable story and adapt it into the big screen is another way people should think about besides writing their own scripts. (Rea & Irving 2010, 6-8.)

When it comes to serious shooting, a shooting script with numbered scenes is necessary. After marking scenes with a number code, a shooting plan should be created for each scene, which requires script breakdown and creation of storyboards, floor plans, or both (Rea & Irving 2010, 19). There are detailed description and steps to make script breakdown provided by Rea & Irving (2010, 45-51), but the author feels it is not necessary for this project. Consequently, only a simple grouping for several shootings in the same location was made as a reference document. For example, all the actions performed in the library were shot at the same time, one after another, no matter which video each scene was in. The grouping of actors/actresses was also taken into consideration. Due to the limited number of actors/actresses in this project, when the director and a performer had a shooting date together, all the scenes in different videos that involved him/her were made. This is a common challenge in films that include a great number of players. However, in this project, fortunately it was possible.

Brian Klems (2012, Date of retrieval 12.08.2014) gives a practical suggestion on the Writer's Digest website. He recommends that every paragraph in the script should not exceed three lines. Additionally, because of visual requirements, the script language should be succinct and "describe the things we can actually see or hear onscreen", emphasizing the action of the character more than describing their inner emotions like in literature publishes. Movies scripts are different from novels, as "movies are about the external, novels are about the internal". An example from *Saving Private Ryan (1998)* script, in which words were used effectively to help visualize the screen, is provided: "The thunderous sounds of a massive naval barrage are heard". (Klems 2012.)

Furthermore, regarding the script format, Klems (2012) thinks it should be easy to read with as much white space as possible. He also reasons that business people do not have time to read many scripts and that making the document spacious will catch their eyes faster and highlight the writer's work among other scripts. On the other hand, any writing that lacks visual elements, significance to the movie's progress, or "depth and insight" to the character's actions should be cut out of this document. (Klems 2012.)

Another tip, "enter late, leave early" mentally focuses on the structure of the script, or the flow of the story rather than language or form standard. It is recommended that one-step late film scene will trigger the audience's imagination and require further thinking about what will happen beforehand, therefore creating their own allure as well as cutting inessential details. The same effects are produced with the phrase "leave early" (Klems 2012). For example, in the video *Re-use*, instead of letting the main character bring the light bulb she chooses from school to home, the scene ends when she interestingly looks at the bulb and later starts when she sits down on a chair with full equipment around, ready to operate the bulb.

Gates (1999, 68) writes, "For every period of shooting there should be two times for pre-production and three times for post-production". This is an interesting statement. As the author had understood from the beginning of this project that there might be separated periods of filming in which pre-production, production and post-production are three phases with different investment in the amount of time and effort, as the statement recommends. Nevertheless, in the process, she perceived that it was not that simple, because these processes are mutual. In this project, it was rather common that the script was fixed during a shooting event or during the editing phase. For example, when filming video *Re-use*, the author needed to cut several scenes due to the lack of time or change of location for better lighting. Likewise, in the editing phase, the order of the scenes was many times reconstructed, because of something illogical in the script that the author had not been able to realize initially. The following example is from the script of video *Re-use* (Appendix 1).

> ### Scene 1: *FLOWER SHOP, MORNING*
> *Ella is slowly looking for a tiny plant among numerous colourful flowers in a small quiet outdoor flower shop. Suddenly a message from her friend suggests coming at once to event "Take it or leave it".*

Scene 2: OUAS's CORRIDOR B, MORNING

Paolo shows interest in the "Take it or leave it" poster that he suddenly notices on the way to the library on a dense bulletin board.

Scene 3: DENIS's MAILBOX, MORNING

In a narrow walkway of a PSOAS student house, on the way to his room, Denis wearily checks his mailbox, which is full of colourful magazines and newspapers.

Scene 4: DENIS's ROOM, MORNING

Denis tosses a newspaper onto his existing pile of magazines and heavily plops down into a chair. He skims through Oiva's notifications and carefully reads "Take it or leave it" information. Denis hurriedly checks the time.

Scene 5: OUAS BICYCLE AREA NEAR HALL A, MORNING

Hans brings a square carton of unnecessary objects including shoes, light bulbs, clothes, and cables to school by bicycle in a nice summer morning. After leaving the bike, he brings the carton into Hall A, then quickly unpacks and classifies them into the correct places.
Camera stops on the student's way to catch the school's name board.

3.3 Production visualization with storyboard

Alfred Hitchcock, the famous American director who relies heavily on storyboards in his production, enjoys saying that his films had been finished before they were ever made. Storyboarding is a useful way to present the movie before the shooting process actually begins. Storyboards are drawings on paper that illustrates the subject matter and camera projection; they also take notes on the camera movement and scene transition if necessary. In short, they are drawings of what happens in the real movie, so that the director can envision and consider every shot. (Katz 1991, 23.)

A movie preproduction step may consist of numerous drawings resembled cartoon production in the old time, or it may be just several pictures to represent the main content of the video and

arouse interest from viewers. In movie sequence, it is not necessary that every piece of drawings is seen as it was in the storyboard, because later the director can change or adapt it.

Drawing is a helpful but not indispensable skill for the storyboard man, as long as the thought and mind can be transfered onto paper with pencil. The pictures may be very crude with only several sketches or very professional with colour mood and tone displaying scenic landscapes; they are all useful if the viewers can interpret and understand the ideas behind them.

For the directors, storyboard is a helpful tool whether they follow it or not. As it conveys the flow of the story, this work does not only depict individual shots, but also generates more ideas and points out from the flow which one may fail when it is filmed (Katz, 1991, 50). Thereby, the director can decide on necessary cuts or changes.

In line with Katz (1991), the process of visualizing through storyboards also prepares the crew members to better cooperate and understand one another as well as the movie. For example, the cameraman can consider from which angle he should set the camera; the technicians can build the scene as described; and the gaffer can better design the lighting plan. A storyboard is a powerful way to help every member of the crew to imagine the shot.

One disadvantage of storyboarding resides in its impossibility to transfer the movements, lighting, or transition. Thus, instead of presenting the dynamic form of these elements, the artist can mark or take notes about them. The dolly and pan of camera or the angle changes, e.g. from long-shots to close-ups, are done with symbols (Katz 1991). For instance, arrows indicate the direction of camera pan, while rectangular lines form the frame and define the action of zooming in and out for better shots.

Film production utilizes not only storyboards but also photoboards and other software/animation programs to draw up the scenes in the idea visualization process. One can choose the most suitable way to present the ideas. In this paper, storyboarding is mentioned as it is a simple, fast, and effective traditional approach that does not cost much. Figure 5 shows images extracted from the author's own storyboard (Appendix 5).

FIGURE 5. A storyboard page from video Reuse

In this project, the storyboard and script were also used to communicate with the performers. In the beginning, there was some misunderstanding when explanations were only done verbally.

Then, with the storyboard, it was easier for the actors/actresses to understand what they should do and where their actions should take place.

3.4 Cast and crew

Cast and crew refer to the human resource of a film team. While they both engage in filming activities, their roles are different.

Cast

Casting is the process of choosing all the people that appear in the movie, from main actors to stuntmen and crowd performers (Gates 1999, 9). Generally, when the directors have the script in hand, they will start looking for suitable actors based on special requirements such as gender, age, ethnicity, and characteristics.

Each director has a different style of choosing players. Some directors may rely on the calibre or suitability of the role, whereas others focus on the face spirit. For examples, Yu Zheng, a Chinese director, says that a good actor for his movies must have a beautiful forehead, as it defines the beauty of a man (Joanna, Date of Retrieval 11.6.2014). It is a reasonable argument, as the context of his movies is ancient China, in which most of the male actors have to completely show their forehead. A popular trend is the recruitment of celebrities such as singers, sport athletes, racers, etc. to join the film, because they possess perfect appearance with a good fan base. In some cases, this also means a good number of viewers.

It is not necessary that all performers must be found at the beginning of the project. Some videos need not human performance at all (e.g. wildlife documentaries), while other films may find it difficult to prepare the cast beforehand. For example, in an interview video, the interviewee can be invited before or right when the video is in progress. An interview for newscast with people in a warzone can be made with any person on-site, whilst a talk with an expert in a science program requires more investment in finding the right person and having some discussion before the actual filming begins (Riemke-Gurzki, Interview).

Thanks to technological advances, the process of casting nowadays has become easier. CGI (computer-generated imagery) technique can create a unit of army or turn people from tall to short, from normal to handicapped, and so on. For instance, in *American Captain: The First*

Avenger (2011), the first few scenes show a flabby, skinny, and ordinary main character played by Chris Evans; but after receiving an injection resulted from a scientific experiment, he becomes a six-pack hero. To create the difference of the body before and after the injection, the filmmakers used special computer techniques to shrink his body down (Warner 2011). Without technicians and special effects software, the director would have had to use two actors, because the physical bodies were too different from each other.

Regarding the casting of actors/actresses, the author faced great difficulties. The recruitment notice was put on the school's intranet and the author's Facebook status; some teachers were also asked to pass on the message. But there had been no reply. After a long waiting time, the author decided to directly ask some friends for help and all of them agreed. It is certainly risky to recruit just friends, because it is possible they do not fit well with the roles, but luckily in this project, the characters were simple enough and did not require complex acting. Therefore, the only requirement was that they would be energetic and cooperative, which all the cast did just fine. At the end, the author realized one lesson: there should have been some clarification for the roles in the advertisements, because people might be reluctant to perform some of them because of their limited acting skills, but they were more open to play static roles such as a passer-by or a student studying in a computer room.

Constant communication was the key element to teamwork. It was important to exchange thoughts, not only to limit misunderstandings, but also to express supportive ideas. At the beginning of this school's project, there had been a lot of confusion about how an actor should perform, until we sat down together and had some discussions, even some drawings, to demonstrate exactly what the director wanted and what the performers could offer. This bottleneck was because the script enables various imaginations, as the text only shows how the incidents happen, it does not illustrate the movements and feelings of a specific shot. For example, in video *Reuse*, the script only guides the performer to be in the crowd, looking at things and eventually taking the Ethernet cable. We did not know beforehand how crowded or how the site would be arranged, so it had been impossible to prepare the movements until we were actually at the site; only then could we choose better angle and better steps for the main character to follow.

Crew

The crew includes everyone participating in the process of making the movie. Depending on the size of the project and its budget, the crew size may vary greatly. Projects with big budgets have more chances to recruit more people. A big film crew includes producer, production manager, directors and assistants of all departments (i.e. photography, art, camera, casting, light, editing, sound, music), securities, supervisors, health experts and so on. However, there may be only a few persons to make a short movie, in which the director does the work of screenwriter and cameraman as well. This is rather popular with student projects, where students cannot hire other people to collaborate with them, and the content of their movies does not require large investments. There is no specific requirements on the number of people in a crew as long as the project can be finished successfully. (Gates 1999, 9 & 10.)

In this project, the author worked as the director, screenwriter, storyboard artist, and editor all at the same time. The idea of having a crew sounded tempting at the beginning; but after weighing the pros and cons, considering the time and efforts invested to have an ideal team in comparison with the scale of the project and its workload, the author decided not to recruit more people to save time. Fortunately, in the process of filming, there were many constructive feedbacks as well as ideas from the players and the author's friends on how to make the shots better.

Legal issues

For each person performing in a movie, there should be a contract signed at the beginning with a consent statement. For all performers without a salary, they should acknowledge it before the shooting starts. In a big project, performers should sign a *Release form*, acknowledging the rights and responsibilities for legal purposes (Gates 1999, 145). In case the director feels it is not necessary to make a serious contract, the players should at least know their role in the movie and agree on how the movie is going to be published; especially in an interview, every editing related to that person needs to be informed and agreed upon (Riemke-Gurzki). In this project, there was no paper signed for legal purposes but the people involved were informed fully about the project's purposes and how their image would be used. Even the scenes where the main character was an animal (e.g. cow or horse), the people who took care of them should be noticed about the filming. Most of the owners of the shooting sites were willing to let the author do her job after they knew the project was for educational purposes. Also, filming permission from L&T Company was obtained with the help of the commissioner.

3.5 Locations and facility

Set aside from human resource, equipment and background settings are also an issue to deal with. This answers the questions where the event happens and what equipment is used to capture the footage.

Location

Preparation for location needs to be done as early as possible, as the procedure of getting permission or making contracts may take time and negotiations. For example, in case of filming on a street in America, permission from the police or authorities is required. Some shootings require special effects or setting, such as winter/summer scenes or class time scenes. In a low budget project or if the crew is unable to create effects after all, the shooting schedule may be planned carefully in order not to miss particular occasions. (Gates 1999, 122.)

In this project, initially, the author planned to shoot mostly at Oulu UAS, including Wallu restaurant, computer room, B-corridor, A-Hall, outside area, etc. Then, due to some changes in the script, the list of locations went longer. Some shots were decided to be filmed at students' house, the airport, a horse camp, a farm, etc. The changes in location might bring about excitement to the viewer, provide fresh air to the whole movie, and avoid tedious repeated scenes. The footage itself also became more natural. The downside of this was time consumption to travel from site to site. For example, it took half an hour to drive to the countryside, where some cows could be found for a three-second shot.

Also, permission was an issue along with locations. For filming around Oulu UAS School of Business and Information Management campus, the author got permission from Ms. Minna Kamula, the school's senior lecturer and at the same time the project's commissioner. For other scenes, the author needed to talk to the farm's owner, officer at the airport, or manager of the chosen company in order to use their sites. The conversations went smoothly with the support of the author's Finnish friends to translate the language. When these people knew the shooting is for educational purposes, all of them would like to cooperate.

Video *Reuse* is an example on event-based shots. In this product, the main story depends on one specific event: "Take it or leave it" flea market by Oulu UAS on May 7, 2014. Although that day was rather early and the author did not have enough actors yet, filming activities still had to be

carried out, because it was impractical to ask the school to host another similar event when everything would be ready. As a plan B, the author intended to perform as an actor herself if nobody suitable was found. Luckily, at the last minute and right on the site, the author managed to have one friend become the much needed actor. We had a brief five-minute discussion about his role in the movie before shooting.

Facility

As shooting equipment is taken into account, a camera is mandatory. In some cases, more than one camera will serve better. For example, for an ongoing event (e.g. a football match) that cannot be filmed twice, two or more cameras are able to capture more angles. It also depends on the project, the weather, and the shooting location that lighting devices and bipods/tripods are necessary. Before shooting, the camera lens should be checked carefully to avoid regrettable issues due to negligence. Professor Riemke-Gurki in his lecture (2013) showed an example in which there were small stains in the video sequence due to the camera lens being stained. For this kind of error, the cameraman only sees the flaw after the shooting, or in a worse situation, when the footage is already imported onto the big screen. This is a waste of time as the actors need to perform that scene again. For this project, the cameras were borrowed from Oulu UAS and Oulun Työstökeskus Oy, a Sony Handycam and an LG Optimus respectively. These were both digital cameras that required the checking of battery and memory card before filming.

The selection between tripod and monopod also makes a difference to the scene. Both pieces of equipment support stable scenes as they avoid camera shake. However, the operation of tripod takes much more time and may even be complicated. Therefore, if the shooting place is not affected by strong winds (ideally inside), monopod may serve as the optimal equipment because of its flexibility. In contrast, the use of tripod is appreciated when filming outside in harsh weather. For example, when standing by a river to take the image of an industrial chimney, the author was nearly flown into the river by the strong winds. Even with the monopod, the camera was still shaken violently until the author changed to a tripod. However, this does not mean we can use only tripod or monopod, because a combination of these tools also brings about success. In many scenes of this project, a tripod was used with one camera to film the whole incident in a long or medium shot, and a monopod with the other camera to capture details, such as a close-up shot on the face or a cut-in activity. This enabled taking more angles simultaneously. Thereby, the actors had to perform only once, as all necessary angles were made from the first try.

Besides tripod and monopod, if the scene requires complex camera movements, for example, a slider for a long smooth sliding movement, more tools are needed. With only tripod or monopod, it is nearly impossible to manually maintain the accuracy and continuity throughout the movement. In his video tutorial *HDSLR Filmmaking for Beginners - Basic Camera Movement*, Victor Ha (2012) suggests the correct use of a slider and provides some successful examples of this movement. He points out that the user should understand the nature of different slider lengths, including 2ft, 3ft and 5ft. While the first length adapts to traveling and event filming because of its "mobility and versatility," 3ft slider requires more space and provides longer duration. Finally, 5ft length is suitable for shots that are planned initially. In addition, skilled film crews use plenty of professional equipment such as sound accessories, follow focus, jib cranes (equipment that lifts or lowers the camera and moves it horizontally), Steadicam systems, lighting systems, windshields, etc. to help capture ideal shots (Documentary filmmaking 101, Date of Retrieval 19.06.2014).

Also, it is of utmost significance to determine what properties are needed for specific scenes. When filming video *Re-use* in a student's room, the author intended to concentrate on the actions of using magazines and newspapers to build a stool and a trash box. However, after finishing the stool, we found out that there was no staple, so it was impossible to make the trash box. Because of the video's limited runtime, we did not need to film the second part at all, but the lesson was that the author should have been better-prepared. In another scene that required a clock, the author switched to a mobile phone to show time because there was no clock in the room. The lack of properties might change the script, provided that it did not have any negative impacts on the content. For better preparation, the author wrote down a list of necessary objects for each scene, together with the location, duration, and number of actors. All the lists can be found on Appendix 6, Appendix 7, Appendix 8 and Appendix 9.

4 PRODUCTION

This section discusses light and camera settings. For light arrangements, a comparison between human eyes and camera eyes will be mentioned before going to specifications such as lighting concepts, three-point light triangle, techniques, and safety issues. Regarding the use of camera, the factors of angle and movement will be analysed.

4.1 Light

Good lighting plays a vital role in digital products such as photos and videos. For a photography or cinematography project, inadequate amount of light source does not only make an image look bad, but also causes trouble for later editing. Furthermore, according to John Jackman (2010, 1), this element conveys the product's emotion and spirit to the audience, which makes its role much more important than just illuminating the objects. In some cases, lighting additionally creates "illusion of depth and size", in order to prove something that may not be true in reality, as "we are not really trying to capture what the eyes see, we are trying to capture the mind's interpretation of what the eyes sees, which can be a wholly different thing" (Jackman, 2010, 2). Therefore, the importance of lighting should be recognized.

4.1.1 The camera and human vision

In his book, Jackman provides interesting facts about the difference between human eyes and the camera vision system, thereby improving our knowledge of what the eyes can see in reality and on the TV/monitor screen. He points out that in reality, the human vision can even distinguish an object from a nearly completely dark background, thanks to the ability of the brain that utilizes the knowledge it has already known to interpret the image received from the eyes at that moment. Consequently, it can guess the object if the perceived image is not clear enough due to the lack of brightness. (Jackman 2010, 11-17.)

For example, when a person goes to the kitchen to get a glass of water at night, he or she is able to grab the right thing without turning the lights on, because the arrangement of the kitchen has already been known. In this case, the eyes only see a blurry image of the object, but the brain

can tell what it is. Furthermore, humans can also adjust their vision to have a better look by moving their heads or squinting to gain extra information if they are not familiar with the object (Jackman 2010, 12). That is to say, there are many ways people can visually identify the object under different circumstances. The intricate supportive system of the brain is also appreciated.

However, the camera is nothing close to the human brain. It can only perceive a limited range of brightness. Jackman assumes that the human vision can register the contrast range of more than four folds compared with the camera system, which results in the camera's inability to take into its lens exactly what the eyes can see under various lighting conditions. Even state-of-the-art cameras cannot do that. A basic mistake of beginners is to "assume that the camera is going to react to a scene the same as the eye", which is not usually possible. (Jackman 2010, 14-15.)

Apparently, there is no way a viewer can identify the object unless it is shown on the screen. Squinting, touching, going close to the screen or changing the viewing angle are not useful at all. In short, the audience can only perceive the image in a passive mode. This brings about some advantages and also downsides to filmmakers. One of the challenges is the loss of an object's 3-D feel, as it is being shown onscreen. The screen is only "a flat piece of glass with flickering coloured lights projected on the rear," which explains why it is impossible to generate the depth and feel, unless appropriate artificial methods are put to use. Jackman also argues that except for lighting and camera motion, there is no other way to reveal depth. Specifically, his solution emphasizes "subtle pattern of reflections, highlights, and shadows on the object's surface". In short, he insists that using only realistic lighting is insufficient for screen products. The film image needs to feed the viewer's brain with more signals that it can process with. (Jackman 2010, 13.)

Millerson & Owens (2008, 227) have the same opinion with Jackman's, that the camera cannot "compensate" for what is seen by human eyes, as though interpret. If there is too much light, it will conceal parts of the picture. Similarly, dark coloured interior often resembles a black-like colour on the camera. They suggest that manipulation be necessary to show the lost details to the viewer.

4.1.2 Light concepts in camera adjustments

The paragraphs below introduce the basic concepts of light, mostly in camera settings, in order to provide the knowledge framework for later discussions.

Exposure and exposure triangle

The first important term is *exposure,* which refers to the adequate intensity of light to trigger a CCDs' (charge-coupled device) signal and increase it without going over the limits. Proper exposure essentially contributes to a high standard product. The exposure is the first test that the camera has to pass before it can actually capture any image, because without sufficient amount of light to activate the chips, we cannot get a fine image. Consequently, shooting in the dark does not brings about a night scene (Jackman 2010, 3). Regarding exposure, the Cambridge in Colour website (Date of Retrieval 01.08.2014) provides some interesting knowledge. It refers to the activity of attaining the perfect exposure value as "collecting rain in the bucket" with three fixed elements: the width, the duration, and the expecting quantity, a combination that yields the correct exposure, which can be obtained in many ways.

The term "*exposure triangle*" relates to *aperture*, *ISO* and *shutter speed* which are respectively represented by the mentioned width, time and quantity. The *aperture -* "the opening in the lens" is a concept referring to camera lens. The broader the lens opens, the more light gets in to the camera sensor, and vice versa. It has a close relationship with *depth of field (DOF) -* "the amount of the shot that will be in focus". The larger DOF it is, the more proportion of the image will be sharp. Consequently, a small aperture will receive a small amount of light and produce great depth of field, whilst a big aperture accepts a large amount of light and provides narrow depth of field. Aperture is measured in f-stops. (Rowse, Introduction to Aperture in Digital Photography, Date of Retrieval 01.08.2014.) The index of f-stops in relation with the open level of camera is illustrated by figure 6. As can be seen from the figure, the smaller the f-index is, the wider the lens opens. The lens will broadly look at the objects with f/1.4 and with f/8, there will only be a small area of lens opened.
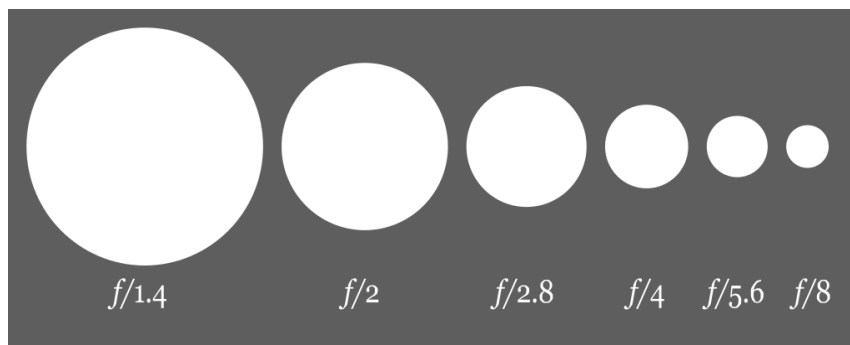

FIGURE 6. Aperture diagram (Wikipedia, Aperture diagram.svg, Date of Retrieval 01.08.2014)

The *ISO* modifies the camera sensitivity towards incoming light. Because high ISO speed generates image noise, or film grain, a low ISO is supposedly better. Popular ISO seen in camera settings are 100, 200, 400, and 800, etc. (Cambridge in Colour). *Shutter speed*, or *exposure time*, specifies the duration that light is allowed to enter the camera and is measured in seconds. In other words, it determines when the camera sensor will be open or close for light. A fast shutter speed means a short time of exposure (Cambridge in Colour). To blur out a continuous motion, e.g. that of waterfalls, the picture is often taken with a slow shutter speed. If this applies, it is necessary to use a tripod to stabilize the camera. This factor also relates to focal length, in a way that long focal length generates more camera shake, in which fast shutter speed is desirable. (Rowse, Introduction to Shutter Speed in Digital Photography, Date of Retrieval 01.08.2014.) Figure 7 is an example of how different shutter speeds affect the images. The right photo was taken with slower shutter speed (exposure time 2/1 sec, ISO speed 80, aperture f/6.3), and the left photo was captured with exposure time 1/4 sec, focal rate f/3.3, ISO speed 200.

FIGURE 7. Difference shutter speeds (Wikipedia, E17 - korte sluitertijd.JPG, Date of Retrieval 01.08.2014).

Dynamic range

Another term, *dynamic range,* is defined as "the range of which a camera can successfully capture the lightest and darkest areas of an image without losing details." It relates to the capability of the camera (Hooper 2012, date of retrieval 01.08.2014). Jackman (2010) also provides his definition on a broader scale: dynamic range is the zone that enables proper operation for a device. This applies to other instruments as well. For camera function, he also agrees with the above definition, marking the zone with the lowest and the highest possible

values of reflected light that the camera can record the details. The ratio between these values is called *contrast ratio* (Jackman 2010, 15).

Contrast

Contrast is fundamental in lighting as well as in colour, font and other artistic combination. Millerson & Owens defines contrast as the "relative brightness of the lightest and darkest areas in the shot". They point out, that the loss of "extreme tones" in an image results from overly light range which is beyond the camera's capability, for example the hard light from the sun that produces big shadows. Also, inappropriate contrast can be problematic, as if may dramatically cast brightness over the details of an image. If high contrast is applied with hard light as the main source without fill light, the quality of the picture depends on the camera's position. For example, if the camera stays in front of the light source, the objects may "look bright, flat and unmodeled", whereas only the edges of the subjects will be lit up if the camera goes behind (Miller & Owens 2008, 227-232).

Jackman regards the contrast management as the work of reducing light proportion in bright areas and increasing the amount of illumination in poorly lit zones in comparison with the eyes' interpretation of normal lighting. He pinpoints that the camera's sensitivity together with exposure setting together contributes to the lighting range, which makes it more complicated to handle contrast. To obtain the best result, the cameraman should work with a collection of reciprocal factors in which just one small adjustment can impact all of the others. These elements include the subject's light level, lens filters, camera's type of chip (single or triple), camera's sensitivity, lens' fastness, relative aperture setting, and the DOF. Luckily, there are only two indices that tend to be changed while the others stay the same: subject's light level and the aperture setting. The alteration is done together with three types of light, namely key light, fill light and backlight, whose definitions of which will be mentioned later. With the key light, zebra display can be used to set the focal rate to avoid overexposure. On the one hand, Jackman assumes that f/4 and f/5.6 receives a lot of attraction, as most of the camera optics obtain precision with these numbers in compared with "extremely wide open or closed down"; consequently, the DOF gains value and so does colour contrast. On the other hand, he admits that with the capability of contemporary digital cameras, running the shots with f/2.8 or f/1.4 is even feasible thanks to "high sensitivity and low noise". Additionally, the establishment of fill light at about one-half of key light's brightness is desirable to lighten up details in dark areas and sometimes backlight shining from above to "separate the subject from the background" also helps to acquire the expected contrast value.

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(Jackman 2010, 30-34.) In their writing, Millerson & Owens (2008, 233) also agree that a combination of hard light and soft light brings about positive results. Moreover, they suggest avoidance of high lighting contrast, which produces overly sharp images, and low contrast, which results in flat-looking images.

Colour temperature and white balance

In accordance with Jackman, light is not only coloured in white but also in other tones, which are called "colour temperature" and measured in Kelvin scale (K). He suggests two "benchmark colour temperature" for the movie industry, namely "photographic daylight (5600 K)" and "tungsten, or quartz incandescent (3200 K)". This becomes important once the directors have decided whether they want to film indoor or outdoor, because tungsten is for indoor shootings with the colour temperature of around 3000 K, whist an outdoor film perceives "white" at a much higher temperature - 5600 K, which falls under "daylight" type. Consequently, an image which is taken indoor with photographic daylight balance will be covered with an unwanted "yellowish-orange" colour. This is essential, because while human vision can register a variety of colour which are recognized as "white", camera can only select one at a time. (Jackman 2010, 35-38).

Therefore, camera needs *white balance.* This term refers more to camera adjustments, to the setting in which we tell which colour temperature the camera should register as "white". Besides, all lights in use should be in the same range of colour temperature as the selection of white balance (Jackman 2010, 38). Millerson & Owens (2008, 85) provides a more technical definition for white balance, regarding the management of it in a camera as "automatically adjusts the camera circuit's colour-balance to suit the colour quality of the prevailing light and ensure that white surfaces are accurately reproduced as neutral". One can use the auto white balance setting in the camera; another method is using a white or gray paper. This paper is shot in the similar brightness as the subject's, which the camera will use later to recognize the correct white balance (The Digital Camera World, Date of Retrieval 06.08.2014). This setting can also be done later in the editing phase with software such as Adobe Premier Pro.

4.1.3 Hard light, soft light and triangle lighting

Good lighting involves light sources, position and the arrangements. The concepts given in the following sections explain and underline the importance of light sources and its positioning for satisfactory illumination.

Hard light and soft light

The difference between hard light and soft light can be recognized based on the shadows. If the highlight's edge is sharp and harsh, the light source is hard light. If there is diffusion on the subject's shadows, giving it a softer look, then a soft light source (also known as floodlight) is in use. (Jackman 2010, 94.)

In addition, Millerson & Owens provide the advantages and disadvantages of hard light and soft light. The benefits of hard light involve sharp shadows, easy limitation of illuminated areas, strong effects, and high brightness level which can light up the subject from a far distance. By contrast, the unattractive and distracting highlights, high contrast, detailed revelation of pattern, and additional lights required for vast zones are among the drawback elements of hard light. Regarding soft lights, their strengths includes smooth shading, limited number of undesirable highlights, less attention focus on "modelling and texture", visible details, and large area scale as good points; meanwhile, blurriness of the surface and texture, difficulty in restricting the desired lighting areas, and dependence on distance to retain intensity are considered their downsides. (Millerson & Owens 2008, 229-230.)

Triangle lighting

Triangle lighting, or three-point lighting, is a concept introduced by Millerson & Owens (2008). These three lighting sources involve *key light*, *fill light* and *backlight*, which have been mentioned in early paragraphs. According to Millersons & Owens, the best outcomes are from various combinations of these three light directions. Among them, the key light plays the main role in illustrating the subject's "shape and surface"; the fill light usually stays at the other side of the camera across from the key light, lessening the contrast and shadows without wiping them out; a backlight (also known as a *kicker*) is placed upside down, shining from the rear to create contours and separation between the subject and the background. While key light and backlight are spotlights and share similar level of intensity, fill light is flood light and of about three-quarters the brightness of the other two lightings. (Millersons & Owens 2008, 234-235.) Figure 8 illustrates the concept of three-point lighting.
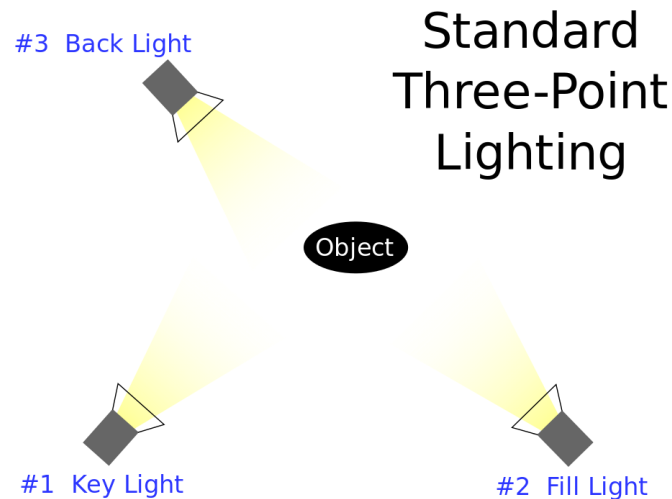
Standard
Three-Point
Lighting

#3 Back Light

Object

#1 Key Light

#2 Fill Light

FIGURE 8. Standard three-point lighting (Wikipedia, 3 point lighting.svg, Date of Retrieval 06.08.2014)

In *Placing shadows - Lighting techniques for video production*, Gloman & LeTourneau (2005) put emphasis on the significance of key light, because its brightness is much more intensive than any other lighting source. Hence, it creates shadows that are useful in revealing the time of the day and the weather condition. For example, an outdoor footage that is shot in high brightness indicates a sunny day; likewise, the same scene with softer shadows "falling at a very oblique angle in a warm light" tends to be the sign of a late afternoon. In a daytime outdoor shooting, the sunlight can be considered one of powerful key lights. For example, in this video project, whenever there was not enough lighting equipment at the shooting place, sunlight as key light is apparently the best choice. (Gloman & LeTourneau 2005, 129-130.)

Millersons & Owens (2008) propose that if there are not many options, the key light should be prioritized, then the fill light and the backlight. In some cases, a soft light source is less intense but may outweigh a hard one due to its generation of more appealing effects, because hard light as the single illumination source may cast unwanted strong shadows and cause excessive contrast. (Millersons & Owens 2008, 249.)

In another source such as The Filmmaker Workshop website (Date of Retrieval 06.08.2014), there is an advanced concept of four-point lightings instead of three, with the addition of one background light that illuminates the background and completely sets the subject apart from it. But no matter how many lights the director should arrange, the most important goal is to create

the right look and feel of the shot, which primarily depend on creativity and management abilities. As student film projects have very little budget and equipment, creativity and organization skills are always appreciated.

4.1.4 Lighting techniques

Lighting techniques include the methods to handle lighting issues besides the lighting arrangement of a number of light sources. Millerson & Owens suggest five points that a director should contemplate before adapting any illumination; these are light's intensity, quality, contrast, direction, and colour temperature. The techniques related to contrast and colour temperature have been discussed in the early paragraphs. Regarding light direction, which the mentioned authors assume to have "tremendous influence on what any subject looks like," there is also a suggested exercise, in which a flashlight in front of a mirror is used to illustrate the concept. In this exercise, the flashlight is placed beside, above, or behind the subject to create different effects on it. (Millerson & Owens 2008, 227-233.)

In order to handle light colour, according to Jackman (2010), using *gels* (or colour filters) is one of the solutions. They are normally polyester plastic planes of transparency colour, and their purpose involves converting colour or creating effect. With the correction function, gels change the colour temperature along the "yellowish-to-blue" range and deal with the green component addition or subtraction. On the other hand, the gels of colour effect "are intended to change the on-camera appearance" of the light, where an intense level of tint is required. (Jackman 2010, 77.)

Regarding the quality of light, Jackman (2010, 34) provides an interesting reminder of the *Inverse Square Law*, which states that if the distance between the subject and a light source is doubled, the intensity will increase four times, and the same theory applies to spatial halving. As a result, one method to control intensity is to adjust the distance from the lights to the subject. If there is a lack of space, electronic dimmer and wire scrims are substitute techniques. Another method to decrease brightness is to implement *diffusion* to the light (Jackman 2010, 34). Diffusion materials vary and are commonly classified into three main groups, namely grid cloth (waterproof woven textile), tough spun (nonwoven polyester fabric), and frost (sheet polyester). Nets and silks are regarded as helpful materials to soften the intensity level and bring diffusion to particular areas. Depending on the intention of use, their frame may be vast (for extreme sunlight), small (for

instruments), or U-shaped with an open side that holds the scrim as it needs to be hidden in the shot. (Jackman 2010, 82-83.)

Also, according to Millerson & Owens, the intensity of light can be measured with a light meter outside, by camera setting, or by reviewing it later. The reasons for underexposure may include low light level, small aperture, and/or improper density of filter; consequently, the solution may involve moving the subject towards the light source, applying a larger f-stop to decrease the DOF, levelling up the camera sensitivity, and/or adding more lights. The method stays the same in the case of overexposure, but with a reversed process. (Millerson & Owens 2008, 228.)

In horror movies

Horror movies may provide the optimal examples on how lighting affects our feelings. It is not that other film genres do not produce good lighting, but in horror movies, techniques of light and shadow can bring about immense fear. In accordance with Rose (2010), by "in horror movies, light is commonly used to reveal or conceal the object of horror by employing various lighting techniques". One of them, "silhouette" the technique where back light is used to make the object become a black figure of itself, is "the menacing posture of figure with the occasional use of colour that creates suspense". To craft the emotion of a face, another technique - uplighting is employed with lights from below engraving shadow to the face, particularly to "the eyes, nose and brow". This change in human perception results in the feeling of "unease and mistrust" from the audience. Spotlighting also shares similarity with silhouette in that it avoids easy realization of the body. Finally, the use of shadows such as those of a monster or a killer moving along the stairs or corridor is rather common in thriller films, as hiding the character's real identity seems to be an effective method to cast fear on people. Rose insists, "While you do not see the figure directly, the distorted shadow exaggerates its features and feeds the imagination". (Rose 2010, Date of Retrieval 07.08.2014.)

4.1.5 Electrical safety when using lamps as light sources

When working with electrical devices, people should follow the precautions so that accidents such as fire, explosion, electric shock, or skin burn do not happen. In the progress of making the videos, the author also got a small burn on her skin when carelessly touching a light bulb at high temperature. More than that, there is a likelihood of fire in a large area if the light bulbs are

directed to flammable materials such as fabric curtains for a long time, causing serious aftermath not only for him/herself but also for other people.

The first thing to keep in mind, which is applied to not only light but also other tools, is the power supply. For each piece of lighting equipment, there should be important information and parameters on power input, for example, on the label of the tool. Equipment that requires high voltage usage should be plugged in a suitable power supply. For instance, in Finland, normal voltage is 230 Volts (International Trade Administration), whereas in the U.S., it is 110-120 Volts. (Jackman 2010, 42.) Consequently, if the device is from the U.S., there should be a voltage converter to use it in Finland.

Jackman provides the following tips for a safe use of electrical equipment. First, seriously inspect the quality of the wire and the outlet to ensure that there is no power leakage from a worn one. Secondly, separate electricity and water when filming outside. The cables should be unplugged and covered at once in the arrival of storm or rain. Finally, avoid connecting the lights with high amperage while they are on. Jackman recommends the use of a switch "that is designed to disconnect the load safety and without a spark". Jackman (2010, 53-54.)

4.2 The Camera

Not only can the content of the movie but also its presentation excite the audience. That is what different camera angles can do. It replaces the eyes of the viewer, tells them the story in a series of scenes that best engage with their emotions. The camera angle can affect the audience's view, bring in new experience, and adapt the subject to its best view in terms of art. For example, the angle can make an object look more powerful, deceive the normal eyes about the real height of the object, or create illusions. Camera is a good storyteller.

4.2.1 Camera angle elements

Camera position, or camera angle, refers to the presentation of on-screen subject which is affected by "the area and view-point recorded by the lens". Mascelli (1998, 24-49) suggests three elements contribute to the camera angle, namely subject size, subject angle and camera height.

Subject size

The subject size refers to the relation between the image size and the frame. Because the movie shows a lot of actions and changes of viewpoint, the size of the subject may also change continuously during different times of recording. There are several types of shots that can be taken into account: extreme long shot (E.L.S), long shot (L.S), medium shot (M.S), and close-up (C.U) (Mascelli 1998, 24-33). In his later chapter, Mascelli (173-196) particularly divides close-ups into more types. Also including those shots in his lecture slides, Riemke-Gurzki (2014) divides them into more categories, with the extras of super close up, medium close up, and medium long shot. Both of these authors agree that the closer the camera lens gets to the subject, the more details it offers and the bigger the subject appears on-screen.

For better visualization, figure 9 by Steven Katz (1991, 122) provides an overview of each type of shot in relation to the human size. As can be seen, the author suggests a total of nine types. However, the E.L.S is not mentioned here as it goes over the size of a human body.
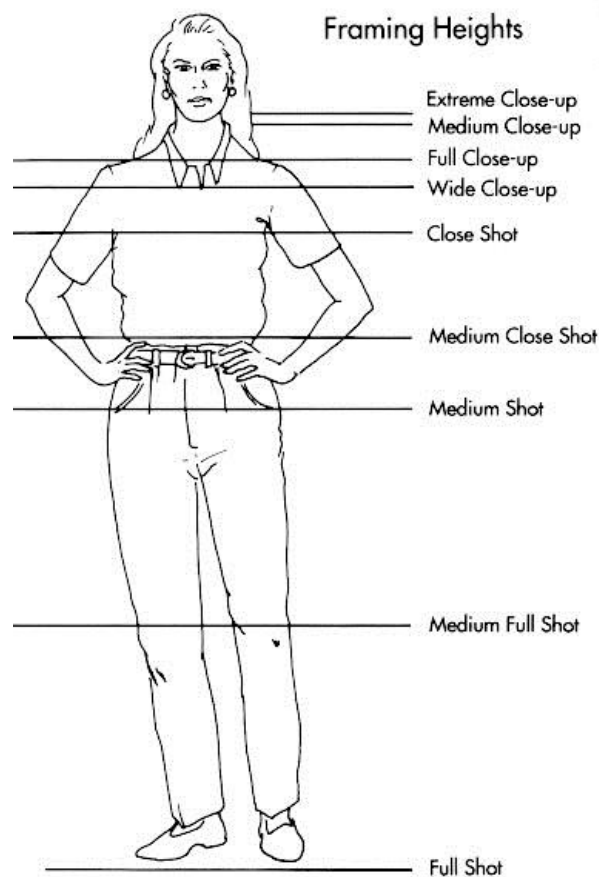

FIGURE 9: Basic framing heights for the human figure (Katz 1991, 122)

Extreme long shot and long shot both show the event from a distance farther than a human scope. The former takes the view from a great distance; it opens up a vast area, typically from a high angle to show the grandeur of scope, e.g. a geographical area or an army in war fights. Closer than an extreme long shot, a long shot scene only concentrates on the location of action; it covers the area that all the properties and characters involved in the story may fit in, with observable exit and entrance. Long shots additionally reveal the size of an object in relation to those of other objects. For instance, humans appear to be small and powerless beside a skyscraper or inside a cathedral with high ceiling. (Mascelli, 1998, 24-26.) Figure 10 comes from video *Waste management*, in which the shot can be categorized as a long-shot, as it shows the whole restaurant looking from above without focusing on any special people. In figure 11, the size of people is not as small as that in the first photo, but it also can be considered a long shot, or a medium long shot, due to its revelation of the location settings in which the character is performing.

FIGURE 10. A long-shot scene which reveals the shooting location and ongoing activities (Waste management)

FIGURE 11. A medium long shot shows the place (a corner of the library) where the character is doing her specific action (Waste management)

In a medium shot or American shot, actors/actresses are filmed from above the knee, or just below the waist to the upper part of the body. The main idea of medium shots is to show fully the gestures, movements, and facial emotions of an individual or a group of people. An American shot prefers filming the individual from below the waist; just like in classic Western movies, the shot shows the guns and holsters the character is wearing. Medium shot, a two-shot in which two players have a conversation with each other, is considered important in movie making. "Regardless of the size of the picture, whether it boasts a cast of thousands of a modest number, the action always winds up in a two-shot featuring boy and girl, hero and villain, or hero and his buddy". (Mascelli 1998, 27-29.) Figure 12 is one example of a medium shot from video *Reuse*.

FIGURE 12. A medium shot (Reuse)

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As can be seen from figure 9, the Close Up (C.U) type of shot offers more details, with five ranges from close shot to extreme close up. The extreme close up can show the part of the face that is expressing the strongest emotion. In Riemke-Gurzki's lecture material, there is a shot of only a girl's smiling mouth as an example. Also, in his book, Mascelli dedicates an entire chapter to discuss close up. The decision to apply a close-up shot brings the camera lens close to the actor, in order to capture his whole face and facial expressions to better convey the sentiments. Considering this type of shot, he becomes more specific on how close it is to the body. He divides it into medium close-up (from waist up to above head), head and shoulder close-up (from below the shoulder to above head), head close-up (only head), and choker close-up ("below lips to above eyes"). Among those, a head and shoulder close-up is the default for the cameraman if no specific instruction is given. (Mascelli 1998, 173-196.)

Close-ups are split into two groups, namely **cut-in** and **cut-away**. Cutting-in refers to the enlargement of a part of an image following the previous larger frame. This provides details by zooming in on the protagonist or the object to elucidate the action, presenting them in objective, subjective, or over-the-shoulder angles. The cut-in type removes unnecessary objects, brings the significant image closer to the audience, and accelerates the time. By contrast, a cut- away shot is separated but still relates to the earlier scene by presenting a concurrent action in another place. No matter how far it is from the first one, it should be "connected to the narrative". A cut-away shot fits in with subjective, objective, and point of view angles. Depending on the situation, it may be useful to show other performers' response to the event, guiding the audience's emotions and giving opinions on the main activity by "showing corresponding action". (Mascelli 1998, 177-183.)

Above all, a movie needs more than one type of shots to tell its story. In addition to the categorization, Katz (1991) argues that the relationship among these shots needs to follow a "continuity style", in which the order of the shots not only visualizes the subject, but also shows the context. For example, in a movie sequence, the interwoven appearance of L.S., M.S., and C.U. should support the flow of the story. A C.U. should only be used after a M.S. or M.L.S. to help the audience understand the background situation before going to details.

Subject angle

Also, in line with Mascelli, the subject angle theory suggests that a subject be filmed with its three-dimensional appearance. This approach provides depth to the scene and solidity to the object. This theory also applies to the human face; if the face is viewed in its profile, the lack of roundness is remarkable. Thus, the best appearance of a face model can be taken from "an angle that presents both the front and side" that is about forty five degrees, also known as the "three-quarter angling". (Mascelli 1998, 34.) Figure 13 is taken from video *Reuse.* This close-up shot reveals a forty-five-degree angle of the face turning to the right, thereby avoids flatness and looks better than a straight angle. In this case, we can even see the direction in which the character is looking.

FIGURE 13. A close-up shot with approximately forty-five degree angle of the face (Reuse)

Camera height

This term refers to the state of the camera, whether it is looking up or down to an object. It is categorized into eye-level angle, high angle and low angle (Mascelli 1998, 35). They are also applied to describe the type of shots when discussing about camera angle.

The level-angled situation places the camera in the same height, not with the eye-level of the cameraman, but with the subject's eye level, so that the top surface of that subject is hardly seen, and only the front and side are visible. Thereby, the audience can follow eye-to-eye with a character whether that person is sitting or standing. In a close-up that applies subjective view, eye-level camera angle is the optimal choice (Mascelli 1998, 35). The Elements of Cinema (Date

of Retrieval 18.06.2014) website maintains that this shot is popular in video making, especially for "romantic comedies" or news reports because of its neutrality and popularity. Weather forecast is another example of direct eye-level angle use. In movies, level-angle brings about story-telling atmosphere in which viewers do not bear any pressure in following the event. Figure 14 is an example shot for this level angle.

FIGURE 14. A neutral event in the story with eye-level angle (Waste management)

However, despite the balance of shot view, the role of characters may not be equal due to their postures. For example, according to Mascelli (1998, 31), if two people appear in the scene and one of them is sitting while the other standing, the latter person will dominate the shot because of better positioning. That is how "power" is defined in filming.

In a high angle situation, the camera needs to tilt down to take the view. Extreme long shots often employ high-angle technique, as it brings about picturesqueness and aesthetics. This resembles the view of a passenger when enjoying the landscape through a window when the plane starts taking off. Psychologically, the viewer orients him/herself as more powerful than the subject filmed; for example, when the camera angles down to a child, it applies the view of an adult. (Mascelli 1998, 35-37.) Elements of Cinema website also agrees with this idea, summarizing that "this position makes characters look weak, submissive, or frightened" with an example from movie *Matilda (1996)*.

Besides movies, high-angle and extreme long shot are usually adopted in sport events such as a football match, to enable television viewers to observe the whole pitch from above and not miss anything. This angle is also very common in tutorial videos, so that viewers can have a close and clear look at the equipment and the steps, not at the person performing the task. Figure 15 illustrates this idea. On the other hand, figure 16 shows a bird-eye view, where the camera looks straight down from the top of the subject, like the view of a bird (Cero, Date of Retrieval 12.08.2014).

FIGURE 15. High angle shows the main character and the objects that he wants to modify (Reuse)
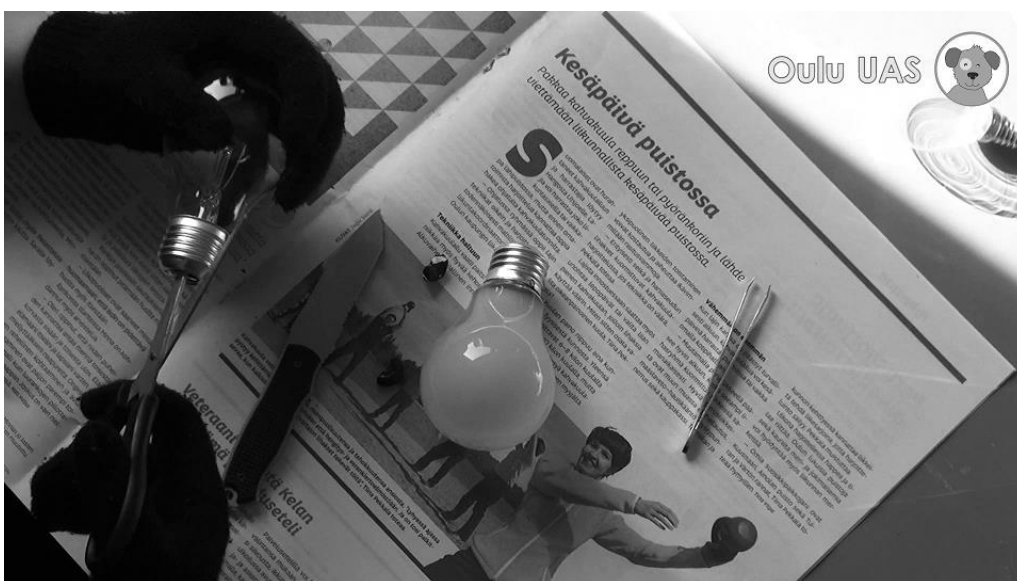

FIGURE 16. Bird-eye angle to show a clear view on the action (Reuse)

Similarly, in low-angle shots, the camera may turn upward to show respect to law and authorities. Oftentimes, this method is applied when the director wants to film unique patterns that are in a higher position in relation to the character, for example, the figures and patterns on the ceiling of a church. In addition, the low-angle camera creates an illusion that the object is larger and more impressive than its usual appearance; therefore, it usually helps emphasize the object's dominance in the event. (Mascelli 1998, 37-44.) Figure 17 presents a snapshot captured from a low-angle. Using this view, the camera was cheating on the quantity and appearance of the newspapers, making the pile look much bigger. Thereby, it becomes the main subject of the shot.

FIGURE 17. Low angle emphasizes on the amount of newspapers

4.2.2 Types of camera angles

According to Mascelli (1998, 13-23), there are three types of camera angles: objective, subjective and point-of-view; these angles determine the viewpoint of the audience.

Objective angle

The objective camera, also known as the audience point-of-view, presents the event as the viewers see. This angle places the audience as an outsider who follows the event without being aware of other characters; therefore, no one should look directly into the lens or have any eye contact with it. One example of objective camera is an extreme long-shot taken from a high angle to show a landscape or a building and thus indicate the location of the scene. (Mascelli 1998, 13-

14.) In figure 18, the girl was filmed in an objective angle. This is a neutral film event and the view obviously reveals the emotion and action of the actor.

FIGURE 18. An objective angle view (Reuse)

Subjective angle

By contrast, the subjective camera views from the personal eyes: in a moment of time, the audience can replace a character to witness the event through their eyes. This angle engages the emotion and experience of the viewers to an the event as if they were involved in the event. For example, a scene that has a person looking off-screen may be followed by a subjective angle, in order to show what this person is looking at, maybe a tall building, or an impressive billboard. Thereby, the view first raises curiosity and then explains to the audience what is happening. However, this angle may upset the audience if it is not used properly; the viewer may feel disclosed or shocked if somebody in the event suddenly looks at the camera lens. An exception that this direct-look is acceptable is weather forecast, in which the weatherman trades eye-contact with the audience to give anticipation of weather condition, or news program where the reporter stands in front of the camera introducing the situation before doing an interview. (Mascelli 1998, 14-21.)

The above snapshot belongs to the same sequence with figure 19. The movie event is as follows: the girl moves along the site and sees a light bulb; then she takes the bulb into her hands, thinking about something interesting. This shot describes the character's viewpoint.

FIGURE 19. A subjective angle view (Reuse)

Point-of-view angle

Mascelli refers to point-of-view (p.o.v.) as the transition between objective and subjective angles. He states, "A point-of-view shot is as close as an objective shot can approach a subjective shot - and still remain objective. The camera is positioned at the side of a subjective player - whose viewpoint is being depicted - so that the audience is given the impression they are standing cheek-to-cheek with the off-screen player". So, technically, a p.o.v. falls closer to the objective angle category, but the lens is so close to the character that the audience can also accept that the angle is subjective, even though the actor does not trade eye-contact with it. (Mascelli 1998, 22-23.)

Figure 20 is not a perfect subjective angle but rather a point-of-view shot, as we can see that the character's position does not allow this view to come from her own eyes. The key point is that the object (i.e. the flower) comes so close to the eyes that the viewers can even feel they are standing next to the main character.

FIGURE 20. A p.o.v angle view (Reuse)

Dutch-tilt (or Dutch angle)

According to Mascelli, this technique makes use of an unconventional camera angle to illustrate unbalanced internal emotions. In details, the vertical axis of the camera diagonally switches the screen to match the vertical axis of the subject, resulting in "weird, violent, unstable, impressionistic or other novel effects". Whenever a Dutch tilt is employed, the camera should slope to a remarkable angle, so that it does not look like an accident. For more details, a left slant indicates something "weak and static", while a right one illustrates dynamic and strong-will. (Mascelli 1998, 47-48.) Film noir and horror movies usually employ this slanted angle to depict intense feelings (FilmmakerIQ, Ultimate Filmmakers Guide to Film Noir, Date of Retrieval 12.08.2014).

Angle-plus-angle

In this shot, the camera adds a slight slant related to the subject, plus a high or low angle, which is known as "double angling". This simply attempts to register all the facets of the subject and avoids flatness, thereby capturing the most beautiful outlook. The three-quarter angling is an example of the angle-plus-angle shot. (Mascelli 1998, 49.) The snapshot in figure 21 is taken from video *Re-use* as an example of this view.

FIGURE 21. An angle-plus-angle view

Over-the-shoulder

Rea & Irving (2010, 167) define this type of shot (OTS) as "a shot of one actor speaking to another when a portion of the second actor's shoulder appears in the foreground of the frame". In this type, the focus subject only takes a certain proportion of the view, which looks over the shoulder of someone standing between that main subject and the camera lens. Thereby, this implies "intimacy and involvement" in the story (LAVideoFilmmaker, How to Frame Over-the-shoulder Guide, with Pretty Pictures, Date of Retrieval 12.08.2014).

Mascelli (1998) considers OTS a type of close-up. He suggests that both of the players appear in the same manner with an approximate match in angling and size, although this is rather challenging. The most significant point is that "a back-and forth series of over-the-shoulder close-ups must appear about the same to the viewer". In an OTS, the cheek of the foreground character should be visible but not the nose and facial traits; on the other hand, the back and side should appear "from a rear three-quarter view". There are two ways to present the foreground performer: making his head and a part of the shoulder appear on-screen, or cutting off most of his body so that only a part of the head is visible. (Mascelli 1998, 176-176.)

In modern cinematography, we can see creativity in the OTS shot from a number of directors, including Steven Spielberg. OTS is one of the techniques that remind people of Steven Spielberg. He stylishly employs OTS shots in which the shoulder occupies a relatively large part of the screen; consequently, the main subject is pushed sideways. Furthermore, because of wide

camera lens, the foreground characters in Spielberg's movies tend to look "much bigger than the character, conveying a feeling of dominance" (LAVideoFilmmaker, Steven Spielberg film techniques - with pretty pictures, Date of Retrieval 11.06.2014.) Figure 22 is an example from *Kiss of Death* (1947) movie trailer. In some sources, such as Elements of Cinema website (Date of Retrieval 18.06.2014), high-angle, low-angle, and eye-level angles are also listed in the topic because of their influence to the underlying meaning of the shot.

FIGURE 22. An over-the-shoulder shot (Wikipedia, Kiss of Death trailer screenshot (10).jpg, Date of Retrieval 12.08.2014)

4.2.3 Camera dynamics

The ability to capture motion by combining a series of images is among the superior elements of cinematography over photography. Not only movement of objects but also camera placement reveals creativeness of the director and adds value to the movie. Simply sliding the camera in some cases may bring about amazing effects over static scenes. For instance, in his webinar discussion *HDSLR Filmmaking for Beginners - Basic Camera Movement* (2012, Date of Retrieval 11.06.2014), Victor Ha provides some of the nice camera movements with slider.

Before going deeper into the aspect, there are common terms of camera movements that need to be introduced. Primarily, basic techniques include tilt, pan, zoom, pedestal, dolly, and truck. These words are quite literal: **tilt** means changing the lens position up and down on a vertical basis; **pan** refers to the horizontal sideways movement, e.g. left to right or vice versa; **zoom** moves the lens from back to front (zoom-in) or front to back (zoom-out) by adjusting "the focal length of the lens" which therefore makes the subject size to be bigger or smaller; **pedestal**

signifies the move of the entire camera up or down, not only the lens (Cassidy 2009). In its glossary, the Internet Movie Database website defines a **tracking shot** (or trucking) as "the action of moving a camera along a path parallel to the path of the object being filmed", whilst in a **dolly shot**, the recording cam is moved towards (a dolly-in) or backwards (a dolly-back) with respect to the observed object. Unlike zooming, a dolly moves the entire camera, so all the objects' sizes will change. (Cassidy 2009, Date of Retrieval 11.06.2014.)

Then, various combinations of these techniques result in more complicated ways the camera can travel. In his movie *Vertigo*, Alfred Hitchcock employed numerous merged shots to bring substantial experience to the viewer. For example, in his review, Jack Ferdman (Date of Retrieval 11.06.2014) points out that a dolly-back and a zoom-in combined in one shot exponentially increase the character's fear of height. That moment is when the detective character in a Hitchcock's movie jumps from the top of one building to another, nearly failing and facing death.

One of the key techniques is Steadicam. Nowadays, it refers to "all sorts of body-worn or hand-held camera stabilizers" derived from the original work by Garrett Brown, who entered the National Inventor's Hall of Fame for his contributions to the movie industry (O'Rourke 2013, Date of Retrieval 24.06.2014). In line with Harris and Perritano (Date of Retrieval 24.06.2014), the human brain plays an important part in adjusting what the eyes see; consequently, the disorientation caused by shaking movements of the body is ignored when the person receives the image. By contrast, even when possessing some adjustment mechanism, a device such as a camera does not have the ability to balance the footage as effectively as the brain can with the human's eyes. Therefore, when a simple platform such as a dolly does not work well on uneven and craggy lands, the cameraman can demand another tool in order to smoothly track the motion. With the invention of Steadicam, the camera movements become more stable, limiting the shake of body and thereby making the shot much smoother. A simple Steadicam consists of an arm, a sled, and a vest, the combination of which does not only eliminate the shake of body, but also provides necessary mechanisms for basic and complicated camera movements. In short, Steadicam refers to camera stabilizing systems. (Harris and Perritano.)

A brilliant example of Steadicam is provided by Lee (2014, Date of Retrieval 11.08.2014) in his video essay with a collection of the five shots in which the camera enjoyed beautiful journeys. They are taken from *Hard Eight (1996)*, *Boogie Nights (1997)*, *Magnolia (1999)*, *Punch Drunk Love (2002)*, and *There Will Be Blood (2007)*, all directed by Paul Thomas Anderson. Being led

by these shots, the audience has the feeling that the camera is telling the story of its own, without focusing on anybody but still revealing the atmosphere of the scene. For example, in the movie *Hard Eight*, not only following the character's movement, but the camera also captures images of the gamblers, giving viewers a glimpse of the casino's interior, thereby deeply engaging their emotion to the story. By contrast, in *Magnolia*, the camera only follows the father and son for a while, and then enters its own journey around the building, with some random focus on the people inside the house, before ending the trip filming the son again. Lee (2014) concludes, "It's a shot that wants to be everywhere at once, and nowhere in particular. The attraction is in the camera movement itself as a spectacle of kinetic exertion: movement for the sake of movement". (Lee 2014.)

5 POST-PRODUCTION

The content of this part concentrates on the process of editing movie sequences, putting in soundtrack, and making subtitle. The theories and practicalities will be discussed with specific examples.

5.1 The continuity

In accordance with Mascelli (1998, 67), continuity refers to the coherent structure and "continuous, smooth, logical" combination of visual and audio elements in featuring film activities. He assumes that the continuity and editing phase should be prepared beforehand in the initial planning phase, presented by a shooting script.

Due to the flexibility of time and space context in motion pictures, there should be appropriate methods to handle these elements, thereby improving a movie's "visual and audio values". Regarding time continuity, Mascelli divides it into four types: present -time continuity, past-time continuity, future-time continuity and conditional continuity. Among those, the first type is considered to be the "less confusing method" to show the story as the story flows in a "logical, straightforward, see-it-now way", so that the viewers are always interested in the events taking place no matter what "story development, transition, continuity lapses" are applied because they do not know what is coming next. The second type is applied either when the story was in the past or when there is a flashback; it is used to reflect the change of time from present to past and may explain the previous actions that lead to present situation. Although it allows the character to narrate the story in the past, a flashback may break the "chronological continuity" and "disorient" the audience. Also, the movie may become less attractive because the viewer already knows the end. Likewise, a flash-forward is used to depict the future. Last of all, conditional time continuity refers to an unreal time, which may happen only in the character's mind and imagination. In this type of continuity, "time may be eliminated, fragmented, compressed, expanded, distorted, or combined in any manner, so that one or more event may be presented in a continuous manner - impossible in real life". (Mascelli 1998, 68-73.)

Space continuity relates to the movement of an action or an object from one place to another while the story is going on, for example, a train journey or car trip. The audience should notice the

"location of action" and the "direction of the movement". Normally, space tends to be trimmed down or stretched out in the editing phase by creating "illusions". For example, the movement of a train is rarely depicted through time; instead, some event highlights and the changes of scenery outside the window can bring about the idea that the train is moving all this time. (Mascelli 1998, 68-73.)

With reference to the breakdowns of actions to be shown onscreen, Dancyger (2007) sees eye to eye with Mascelli. He supposes the editor should select showing either a necessary shot or a "dramatically interesting" shot. He argues that there should be a reason a particular shot is chosen to be part of the movie. As every second of a short movie is precious, all shots that contain little information should be removed. The gap between scenes can be filled in many ways, such as a combination of camera angles. For example, in video *Re-use*, when depicting a donator traveling to the event "Take it or leave it", parts of the scenes have been cut off instead of one camera shot following him all the time (figure 23). His movements after entering the event were also trimmed down. The following figure illustrates the actor's series of action.

FIGURE 23. A snapshot of the character's actions

Regarding continuity in editing, Dancyger (2007) divides the phase into two steps, namely "rough cut" and "fine cut". A rough cut is made by joining footages into the right order, and then they turn into a "fine cut" after being modified following the director's ideas. The former phase puts audio and images continuously together, while the latter one provides "rhythm and accentuation".

(Dancyger 2007, 361.)

To maintain continuity, Dancyger (2007) suggests the contemplation of which factors interestingly contribute to the flow of the story, from shot types to camera angles. The editing phase plays an essential role in doing that. Besides the selection of the best footages, their arrangement and modification (e.g. what shot comes next and how they are tuned altogether) is another question for the director to answer. For example, a cut-in close-up being placed between two medium shots of the same background may help the close-up look similar in space and time with the overall scene, although it may be shot at another place and put in later. He adds, "It requires matching action from shot to shot and maintaining a clear sense of direction between shots". To have such a good arrangement skill, the editor should have a rich source to select from. This comes from the shooting phase, in which the directors have caught the performance in numerous angles, for example, they can use many cameras to feature the protagonist in a close-up, a medium shot and a long shot. Dancyger assumes that a number of directors prefer filming the whole movie in "long shot, medium shot and close up" so that they acquire "maximum flexibility in putting the scenes together". But this approach takes much time, effort and memory. (Dancyger 2007, 362.)

Mascelli (1998, 86-114) insists that the maintenance of direction is an important part of continuity, as it provides clarity and consistency. Dancyger also agrees with this. Unlike actions in theatrical plays or real life, the story flow and film sequence do not need to show every single move of the actor/actress. For example, in a conversation that has more than two people, the direction in which one character is looking and talking should match that of the other character. If the person A is talking to person B, his or her eyes be directed to where person B is. Another example provided by Dancyger (2007, 366) suggests that the directions of a character leaving and returning to his house be reversed in relation with the scene frame. "Contrasting screen travel may be used to show subject going and returning", suggested Mascelli (1998, 88). This avoids causing confusion to the audience. Also, cut-in and cut-away close-ups supportively create a time lapse and let the scene flow more smoothly onscreen.

The first shot of the sequence should indicate the background in which the events occur. Dancyger (2007, 368) calls this an "establishing shot" which reveals the context of the scene. He writes, "An establishing shot of the location sets the context for the scene and provides a point of reference for the close-ups, the follow action shots, and the visual details of the location". Figure

10 illustrates the beginning of a sequence in video *Waste management*. The long-shot depicts the overview of the restaurant at lunch time. This shot makes it easier for the viewer to follow the next shots, which were taken from different corners of this restaurant.

While Mascelli (1998) concentrates on time and space, Dancyger (2007) describes continuity in terms of *rhythm* and *pace*. He points out that the relation of shot-to-shot is highlighted by pace, especially in action movies. The speediness of the action series combined with dramatic effects brings about excitement to the sequence (Dancyger 2007, 373). An example of how pace affects a movie can be found in all instalments of *Fast and Furious,* starring Vin Diesel and Paul Walker. The series was made for people who love speed and cars; this fact explains the significance of pacing, which is immensely and impressively featured throughout the movies. Adding pace to the sequence belongs to the second phase of editing, after the rough cut has finished.

Timing and rhythm play key roles as pacing element. In timing, the editor should be able to justify his decisions about where to put a cut-away or a close up in a movie sequence, whether to use subjective or objective views, which transition to utilize between shots, and so on. In order to succeed, the editor needs an "understanding about the purpose of the sequence as a whole". For example, surprise, a critical part in comedy, can be created through timing. On the other hand, Dancyger supposes that rhythm falls under the "individual and intuitive" type of issue, which people will notice if it is flawed. However, he also admits that there are more than just intuition that contribute to a movie's rhythm, for example, the proportional relationship between the "visual amount of information" and the shot's duration. If the information within a shot is considerable, such as a long shot of the context, a shot of new information, or a moving shot, the duration should be longer so that the audience has time to perceive and get used to it. By contrast, the runtime of a close-up, a repeated shot, or a shot with little information should be cut down. Rhythm is also affected by video transition types. Because an abrupt cut may shock the viewer, dissolves are recommended as they signify changes and create much smoother transitions during the sequence. (Dancyger 2007, 272-376.) For example, in video *Waste management,* a transition effect (*cube* or *wipe* transition) is applied at the end of each sequence to prepare the audience for oncoming new event. There is a fade-out between the two parts of the movie, the narration and non-narration, in order to separate them as well as to offer the viewer some time for thinking.

5.2 Editing phase with software

This section mainly discusses the use of computer software Adobe Premier Pro and Adobe After Effects in making the videos. The theoretical base is extensive. However, this paper only touches the basics and does not describe how to make every scene like a step-by-step tutorial does.

5.2.1 The composition

Composition refers to the planning and ordering film components that result in a "unified" and "harmonious" condition. This definition also includes the activity of setting the scene with appropriate placements of objects and players to fit with the director's intention. The composition, together with lighting, staging, and other arrangements, intentionally directs the audience's attention to the desired objects, actions, or performers at a certain moment of the storyThis belongs more to the pre-production and production stage of the filming activity. (Mascelli 1998, 197.) This belongs more to the pre-production and production stage of the filming activity.

In editing phase that uses movie software, for example Adobe Premier Pro, composition technically refers to the arrangement of existing movie sequences. A composition is made from several sequences, effects, audio files, etc., and it can later become a component of another composition. When there are already numerous footages in hand, how to reasonably arrange them to create expected effects is not a simple task. The script has denoted beforehand the placement of the scenes, but in the editing process, if there is an illogical event in the flow, the editor can always rearrange them to yield a better product.

5.2.2 Adobe Premier Pro

Premier Pro is one of the video editing products developed by Adobe. Similar to Windows Movie Maker, Final Cut Pro, or other video editors, this application's functions are based on the timeline concept. Figure 24 is a snapshot of Adobe Premier Pro's user interface. The view provided in Figure 24 is the default layout, which can be divided into four sections as marked.
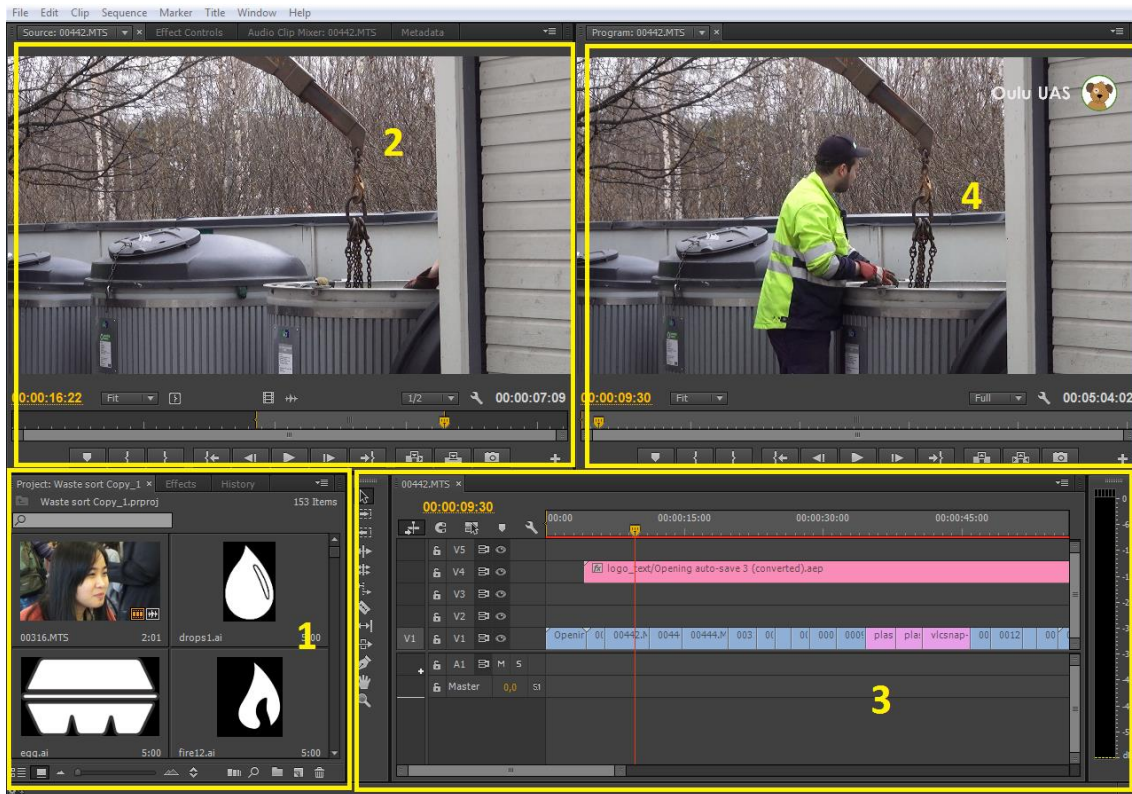
FIGURE 24. Adobe Premier Pro default view user interface

Firstly, section one locates original footages which can be modified and put into a sequence. Also, types of media other than videos, such as Adobe Illustrator file (.AI) and Adobe After Effects sequences or images, are also accepted. Different types of file are visualized with different colours when they are imported into section three: blue represents video footage, purple stands for picture or image, and pink indicates an Adobe After Effects dynamic link.

Secondly, in section two, users can quickly edit the original video before putting it into the sequence in section three. Users can extract a desired segment out of the video by marking the beginning (**Ctrl + I**) and the end (**Ctrl + O**). In Figure 24, the selected part has been grey out from the overall duration. Looking similar to section two, section four simply shows the final video, which combines a number of different footages. In both sections, the users can also choose which resolution they would like to process. In Figure 24, the **Full** resolution is adapted, but for computers with low performance, it is better to apply a lower resolution, at which the program will run faster and more smoothly.

Section three provides a timeline interface for the arrangement of various video parts. There are two separated places for video (upper part) and audio components (lower part). Video footages

which are dragged into the upper part automatically include the audio in the lower part, even though the original one does not have sound at all. To remove an unnecessary audio part is simple, the users can right-click on the right track (for example, A1), then choose **Delele Audio Track**. Before that, they should unlink the audio from the video file by clicking anywhere outside the selected footage. Then, if a more suitable sound should be in the video, it is also positioned within the audio area. On the other hand, if the user wants to mute the sound only, letter **M** near the track name is the place to click on.

Figure 25 provides a better look on section three. The footages do not only stay in one track. This resembles the concept of layers in Adobe Photoshop: the above layer has the priority to be seen over a lower one. In this case, file *logo_text,* which shows the logo of Oulu UAS together with Ykä-koira image imported as a link from Adobe After Effects, lies on top of all other layers. The author wanted for sure that the logo is seen throughout the movie when the scenes change. To make an image fit in the screen of the target video, the user can click on the image footage and select **Scale to Frame Size**. However, it only enlarges or narrows down the image; it does not fix the ratio between width and height, which means if the users has an image at different resolution with that of the current video, they cannot expect it to lie neatly inside the frame.
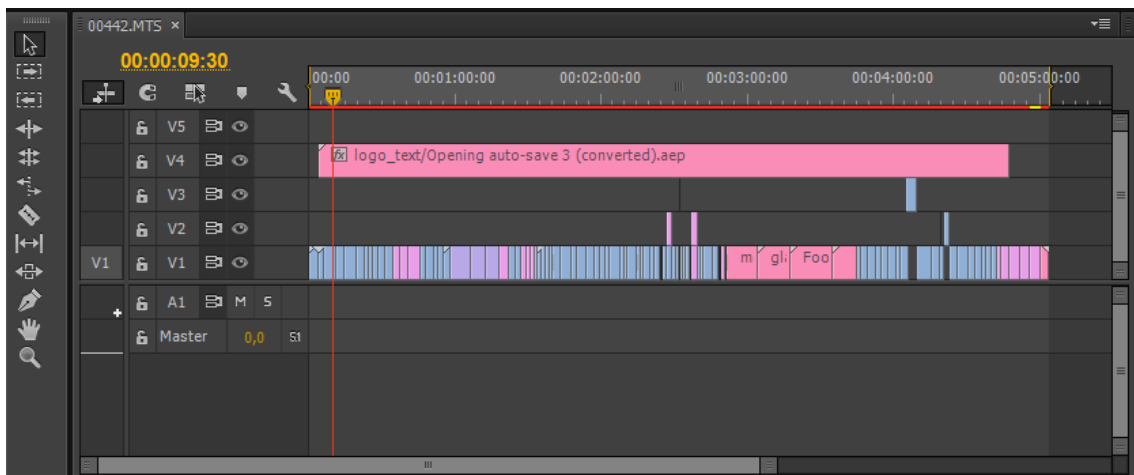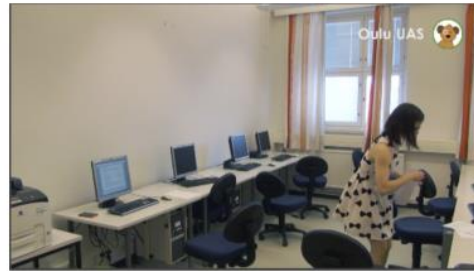

FIGURE 25. Footage arrangement in Adobe Premier Pro

More than just trimming down and positioning the footages, Premier Pro also has other options to optimize the video. **Color correction** is an example. This is a wonderful effect for an amateur cameraman who finally realizes that some of the footages do not have enough lighting or produce a more despairing look than that in early planning. Color correction does not fix all of the mentioned beginners' mistakes, but at least it provides some solutions. Figure 26 demonstrates

the use of this effect for a shot in video *Waste management*. As can be seen, it enhances the appearance of the shot by making it brighter and slightly increasing the green and blue channels.

Before color correction   After color correction

FIGURE 26. Color correction effects

Many effects including Color Correction can be located near the original footages (section two). The user can switch the tab into **Effects**, which cover a number of optimization and modification options, including Presets, Video and Audio Transitions, Video and Audio Effects. As shown in Figure 27, color correction offers various settings to make the video look better. For example, in this project, the author mostly made use of **Brightness & Contrast**, **Color Balance**, and **RGB Color Corrector** effects. Adjustments can be made by dragging the appropriate setting onto the target footage in section three. Likewise, the user can find many other interesting effects for audio and video transition. For example, **Cube Spins** is a common and useful transition to mark the beginning of a new sequence.
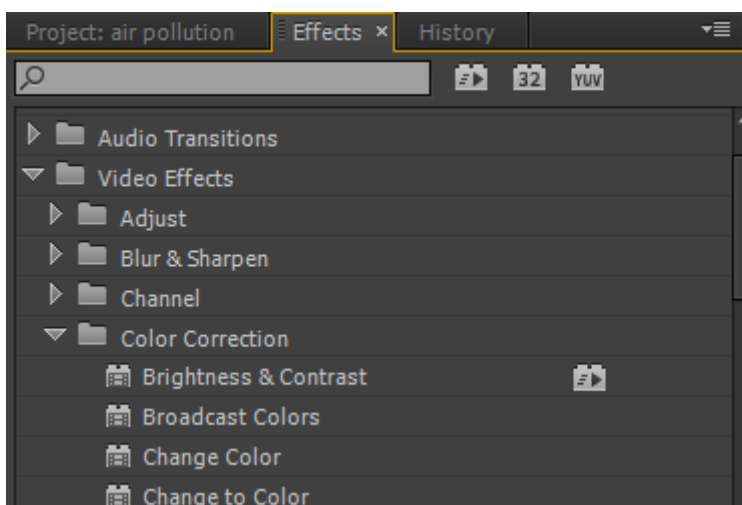

FIGURE 27. Adobe Premier Pro's effects toolbox with a dropdown of Color Correction

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The principal sound modification method encompasses volume fade-in and fade-out, which are illustrated in Figure 28. Using the same concept of **keyframes** as in other Adobe software, Adobe Premier Pro lets users make simple adjustments, such as volume fade in or out by marking milestones. Figure 28 captures the keyframes set for *Grace Behind the Curtain* soundtrack. As can be seen, the current position indicates a volume level of -287,5 dB, which surely cannot be heard by normal human hearing, then, it gradually raises to a certain level after a few seconds. The smooth transition between these two milestones simply produces a fade-in effect.
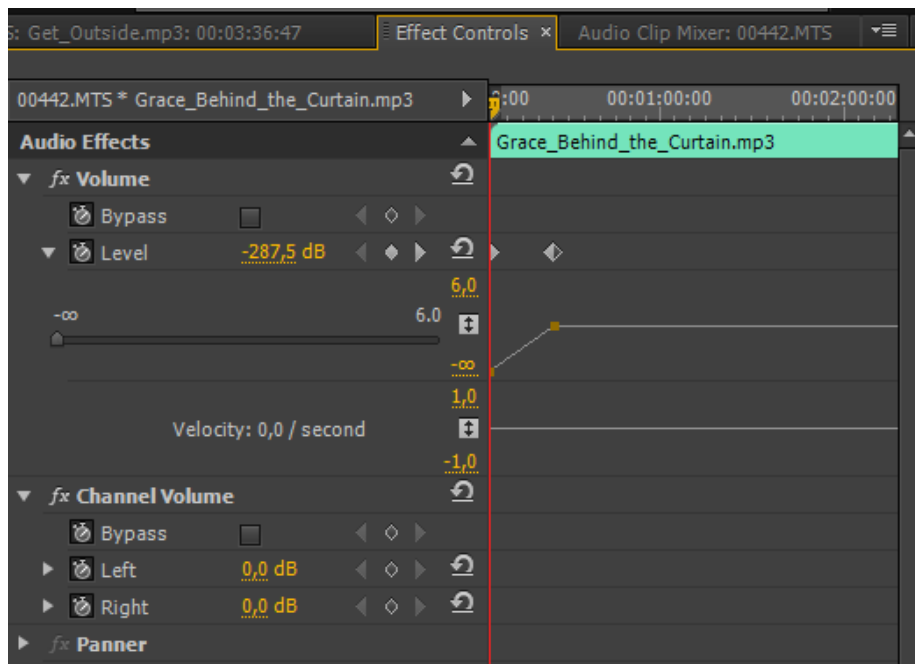

FIGURE 28. Set keyframes for an audio fade-in effect

A benefit for Adobe users relates to the resemblance and interrelationship among Adobe products. For example, an Adobe After Effects composition can be embedded as a dynamic link in Premier Pro. If changes are made to an After Effects composition, the embedded file in Premier Pro will automatically update the modification, so that users do not need to import it from After Affects. The same method works for Illustrator file (.ai) when it is imported as an After Effects component. In Premier Pro, on the one hand, the users can include an existing After Effects file by selecting **File/Adobe Dynamic Link/Import After Effects Composition** and browsing for a suitable .aep composition. On the other hand, instead of importing existing file, they can choose **New After Effects Composition** to open a new After Effects window, which has the same resolution with that of the current Premier Pro file.

Figure 29 presents the output window of Premier Pro. There is a number of values to choose including file format, preset (regarding the quality of the final video), effects, and so on. These settings more or less affect the file size, so the user should consider balancing it and the video quality before clicking **Export**. For example, AVI format may take up to about 10 GB for a five-minute footage, which makes it time consuming to be encoded, transferred, or uploaded. In this project, the author chose MPEG2 to be the customary output format, so the videos weigh roughly 600 MB each. After Export, Adobe Media Encore is launched to process the request.
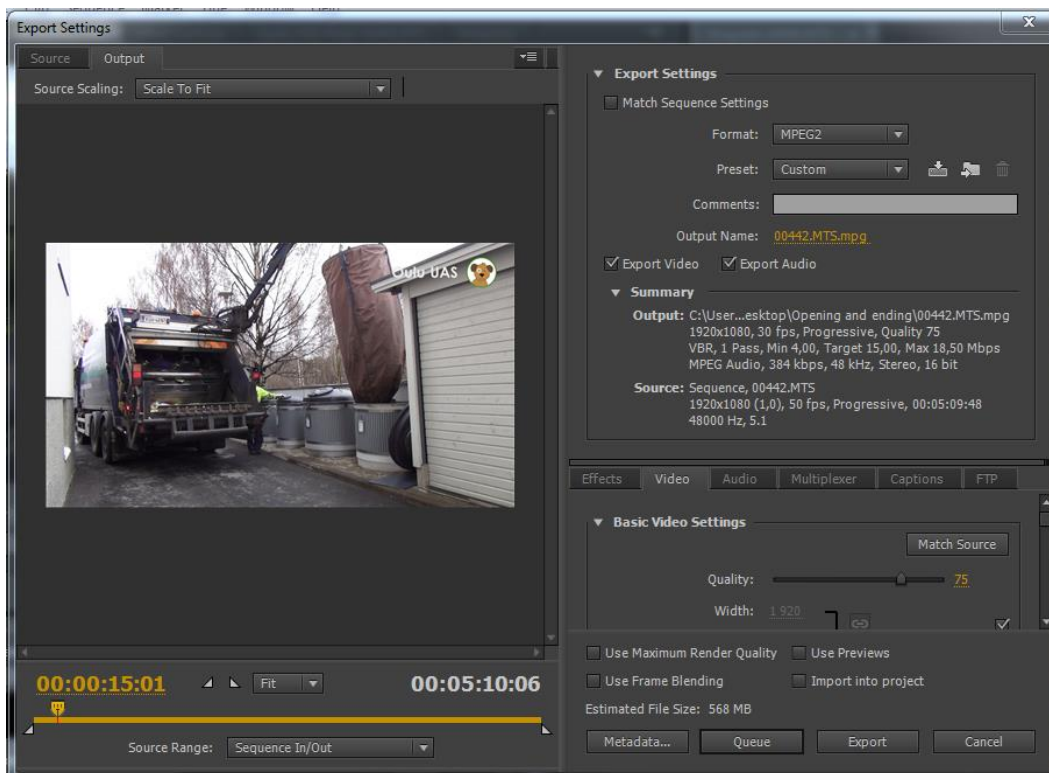

FIGURE 29. Premier Pro output dialogue

5.2.3 Adobe After Effects

Adobe After Effects is another video editor with emphasis on animation. While Adobe Premier Pro merely allows users to edit existing footages and have a limited source of animation effects, After Effects possesses the capabilities of both Adobe Illustrator with vector graphical tools that give users more options to be creative, and Premier Pro with video editing power. Above all, it features the concepts of layers and keyframes, which are familiar not only in many Adobe products, but also in other animation software such as Blender, 3D Max, etc.

The concept of layers has advanced to a higher level in this software, in comparison with Adobe Photoshop or Illustrator. A composition in After Effects involves many layers. In addition, each composition is also considered a layer, which can be embedded to another composition in the same project. This separability brings about a number of advantages. Firstly, it is easier to organize specific animations and then put them together in a bigger one. For example, in video *Air protection*, when it comes to statistics about livestock sector, the pie chart was created in another composition before joining the flow of animation, because the chart itself is fairly complicated to create. Also, this provides excellent flexibility when files are imported to other Adobe products, such as Adobe Premier Pro, where users can select specific compositions they want to include in their new project. However, when files are exported, the default settings only render the current selected composition.

Figure 30 provides an overview of the After Effect interface. Similar to Premier Pro, this software has separate sections for imported files (section one), timeline-based layers with modification options (section two), output video (section three), and special effects (section four). Users can also rearrange these sections to create a layout that works for them. In the author's case, the default interface was in use.
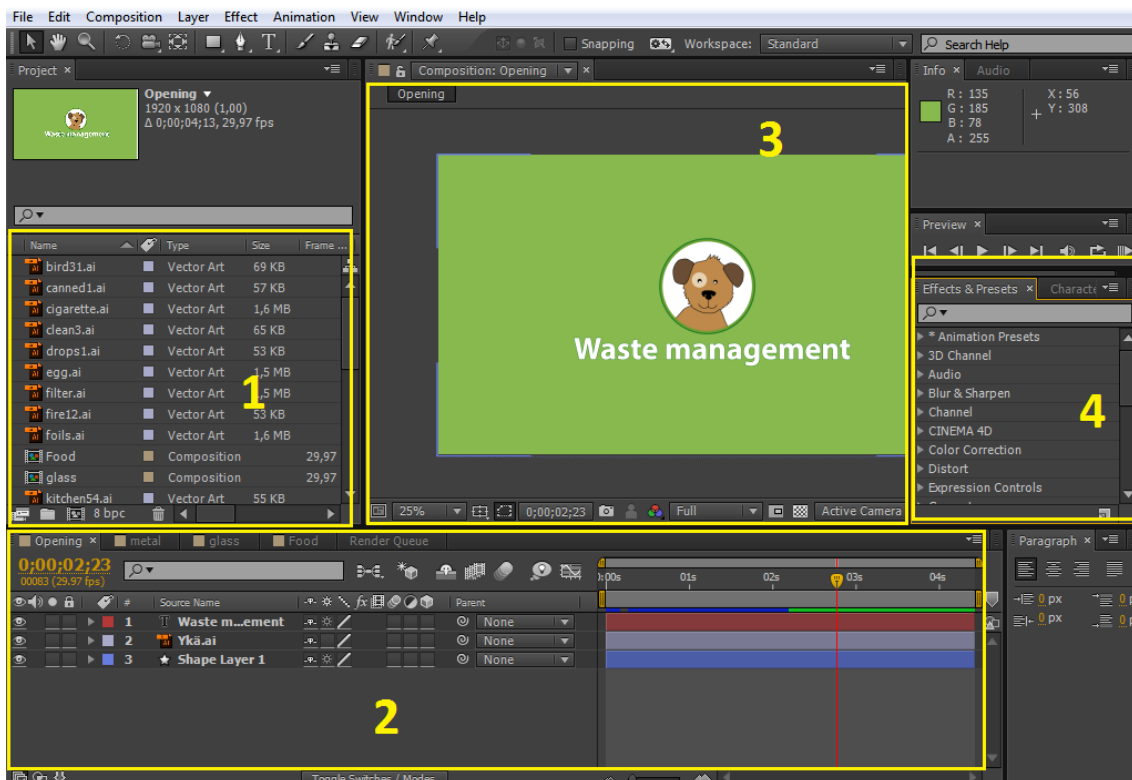

FIGURE 30. Adobe After Effect's user interface

Layers are marked with different colours in Figure 30. Files imported from Illustrator are light blue; compositions set in dark yellow; red symbolizes text; and blue signifies a shape layer. Moreover, there are null layer, solid layer, adjustment layer, and so on. This is no surprise, when working on a composition, the user has section two displayed in a Hawaiian festival atmosphere with a lot of cheerful colours. Every layer is supposed to have its own functionality, but it also depends on how the user arranges it, because there are many ways to make things work. The default attribute for each one includes **Transform**, in which users can set keyframes to change the Position, Opacity, Scale, and Rotation of a layer. For example, in Figure 31, the Ykä-koira logo has been animated by a movement and scaling effect. When new effects are adopted, there will be more settings to manipulate. For example, in the pie chart of video *Air protection*, the sliding animation adopts two special effects: **Slider** and **Radial Wipe**. These together create a particular clockwise sliding movement that the Position attribute could not have handled.
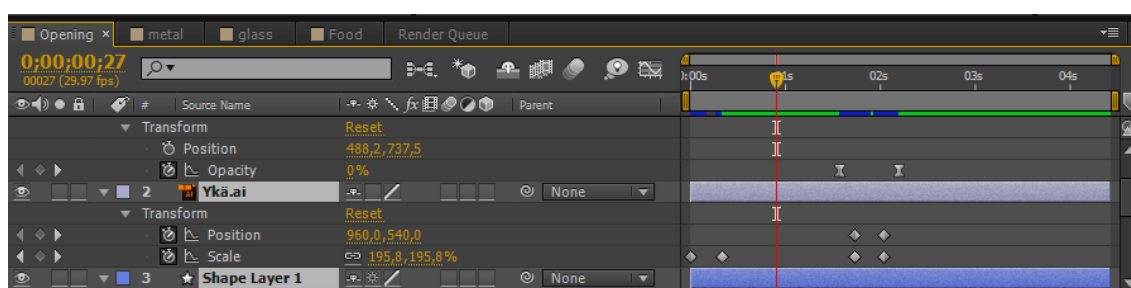

FIGURE 31. Setting keyframes to layers

In addition to effects, **Expressions** is another way to manipulate the animation. They are commands given to a specific layer to guide it on what to do. The same example can be taken from the pie chart in video *Air protection*, where an expression directs the pie part to slide with an offset one after another, creating a much smoother movement.

The last thing the author wanted to mention refers to the link between Illustrator and After Effects. When being imported into After Effects, the layers in Illustrator remain their order, so the animation is fairly easy to create. For example, Figure 32 snapshots the hamburger animation in video *Air protection* adopts an Illustrator file with five layers with the extension **.ai** and are framed in square brackets, which is marked with a yellow rectangle. Although residing in the same project, they can be separately imported into After Effects; thereby, users can animate each of the layers. In Figure 32, as a result of different movements, the hamburger components end up spaciously away from one another.
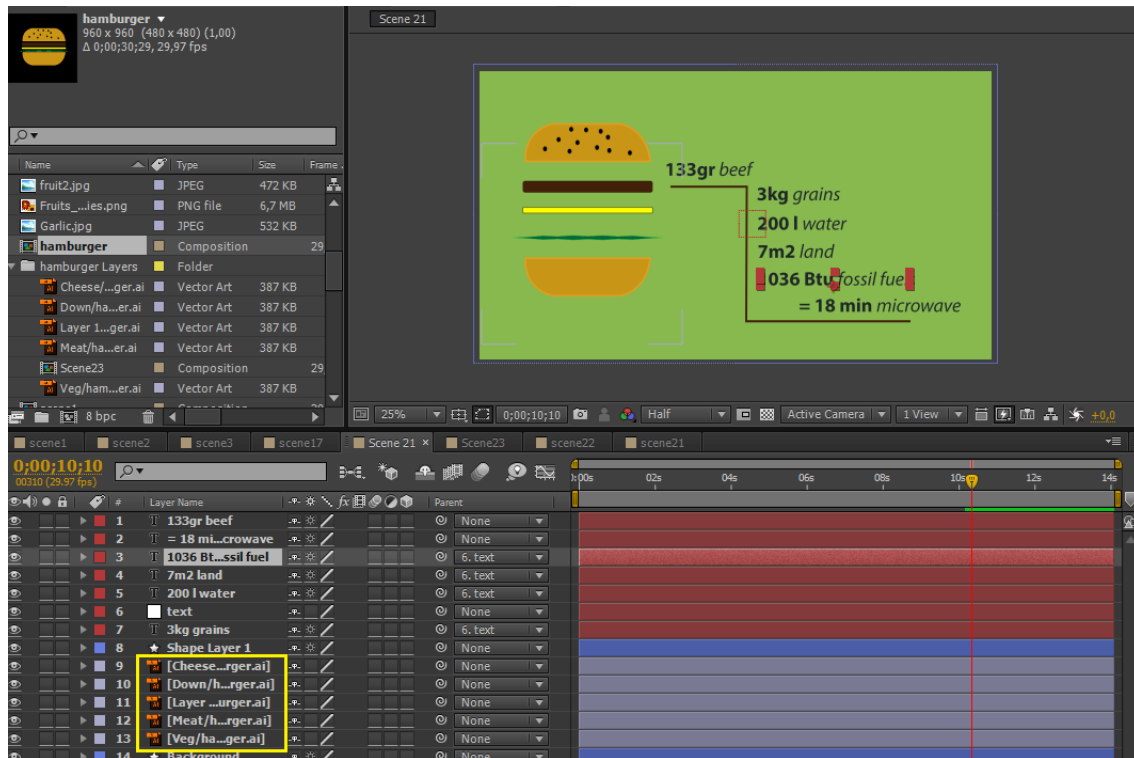
FIGURE 32. A snapshot of hamburger animation, video Air protection

5.3 Sound

Audio is appreciated in this school project in two categories: soundtrack and voice-over narration. The following paragraph discusses about them.

5.3.1 Soundtrack

Rea & Irving (2010) point out, that the use of music had been impossible until a sound mixing process that enables music to be taken apart from the dialogue came into play in 1932. From that time on, the influence of music on the viewer's feeling has made it an the indispensable part of any movie, from horror to romance, or just commercials. Besides promoting film mood, "audible continuity" also stands among the reasons for the use of music by "holding together the separate images on the screen". Other capabilities of music involve connecting shots and scenes, dynamically and intentionally inspiring a sequence, using "enhancement or counterpoint" to "complement or underscore" the film, particularly presenting character through themes, indicating space and time (e.g. bagpipes represents Scottish culture), and generating "emotional expectation". Furthermore, in some cases, music also indicates the genre of the movie; for

example, happy acoustic melodies may imply a love story, while up-tempo dynamic music signifies a thriller, etc. (Rea & Irving 2010, 296-297.)

Music is legally protected like other creative products, so an up-to-date copyright of a soundtrack or a piece of music should be verified before it is used. There are three ways to obtain soundtracks for a video: using music or songs that already exist (copyrights required), using "rerecording of pre-existing music or songs" (copyrights required), and owning the particular tracks written for the project (copyright owned) (Rea & Irving 2010, 296). For students, the free online audio library is the most economical source to retrieve soundtracks or sound effects. One must invest a lot of time and efforts to find appropriate soundtracks for every single moment of the film sequence.

Luckily, some quality audio libraries do exist on the Internet, for example, Youtube Audio Library, which provides all the soundtracks for this video project. Youtube Terms and Conditions for Audio Library allow users to apply its music to the products made entirely by them and not for monetization. The download option strictly forbids the distribution in which the music is taken apart from the video; its use for illegal content is also prohibited. Youtube Audio Library can be accessed through the link: https://www.youtube.com/audiolibrary/music. Figure 33 is the interface of the library, with song name, duration, artist, genre and mood, popularity, download, and rating options. Filtering music by genre is also possible.
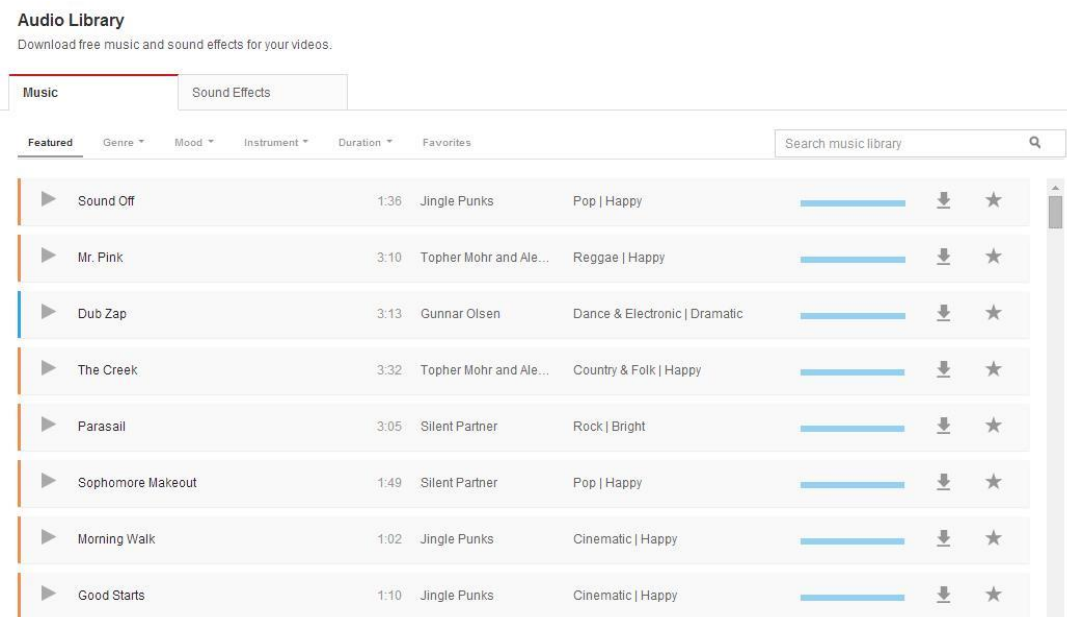

FIGURE 33. Youtube Audio Library screenshot

It may take hours to listen to and choose a number of useful songs, with particular focus on those with light, happy, and rather neutral melodies. The popularity rating is appreciated to choose well-received tracks. For example, video *Re-use* involves "How it began" (Silent Partner), "Grange Party" (Huma-Huma), and "Cloud patterns" (Silent Partner); all of them are pretty popular. For two videos *Air protection* and *Green use of computers and printers*, the melodies tend to be slow, calm, and ambient, because there are also voice-overs. The purpose of using soundtracks that resembles ambient music in a game is to please the ear of the audience.

5.3.2 Voice over

Voice over narration is the isolated sounds articulated by an unseen storyteller or an on-screen character. Its uses include telling stories, commenting, or reporting. (Rea & Irving 2010, 293.) Short videos of wild-life creatures such as ocean fish or forest animals commonly adapt theoretical narrations together with subtitles to provide expert knowledge about life in nature. Also, a narration may begin the story to give the audience necessary understandings of upcoming details. For example, *Bedtime stories (2008)* starts with the narrative voice of a father introducing his son and talking about his family business in hotels and introduces his son with a passion for hotel management: "*I owned and operated the Sunny Vista Motel, which I established on the corner of Sunset and La Cienega Boulevard in Los Angeles, California in the year 1974. The motel was my labour of love, and I ran it with the help of my child....To my boy Skeeter, the motel was a wonderland way too hyper...A magical place full of new adventures for a six-year-old boy, and he always tried to come up with ways to make it even better...*".

No matter when it comes up in the movie, a voice-over falls under one of these three perspectives: the main character (first person), a secondary character (third person), or someone unknown (omniscient) (Rea & Irving 2010, 293). This is similar to point-of-view storytelling in writing. The example above in *Bedtime stories (2008)* demonstrates a first person voice-over with the pronoun "I". Although he is not the central character, the narrator has a role in the story and is telling it from his unique perspective. Likewise, the third-person type is indicated by the pronouns "he, she, it, they", such as in *Badlands (1973)*: "*My mother died of pneumonia when I was just a kid, my father had kept their wedding cake in the freezer for ten whole years. After the funerals he gave it to the yard man. He tried to act cheerful, but he could never be consoled by the little stranger he found in his house. Then, one day, hoping to begin a new life away from the scene off*

all his memories, he moved us from Texas to Fort Dupree, South Dakota". Finally, the omniscient voice of an expert or a commenter providing educational knowledge is often employed in wildlife documentaries,, for instances video "Octopus of the Volcanic Seas (Full Documentaries)" (2013) on Documentary Spill Youtube channel, or in *The Royal Tenebaum (2001): "Royal Tenenbaum bought the house on Archer Avenue in the winter of his 35th year. Over the next decade, he and his wife had three children and then they separated."* (Rea & Irving 2010, 293).

In this school project, the voice-overs belong to the omniscient type of narration. They are necessary in three videos, *Air protection*, *Green use of computers and digital devices*, and *Waste management*, because without narration and subtitle, the audience might feel difficult to follow and absorb the concepts. The voice is performed by the author. Below is an excerpt from video *Air protection's* narration*.*

> ### Scene 1:
> *Voice over and subtitle: Global warming results from unbalance in temperature, due to unbalance in the planet's energy coming and leaving ratio. That also means, the temperature is high when the Earth holds too much energy from the sun without reflecting it back to the space.*
>
> ### Scene 2:
> *Voice over and subtitle: This climate change may include huge natural disasters such as eruptions of volcano, storms, degradation of ocean habitats, and so on.*

The first requirement to create a voice over is a good audio input tool. After that, the voice may undergo an editing step using software to filter noises, amplify, equalize, add sound effects, etc. as needed. Most of current video software such as Microsoft Movie Maker, Adobe Premier Pro, Proshow Gold, Final Cut Pro, and online video tools such as Youtube Editor allow embedding pieces of audio into the sequence. Similar to soundtracks, a number of sound effects can be found on the Internet, such as wind, door bell, elevator, animal, etc. Some sites, for examples, are freesound.org, freesfx.co.uk, etc.

5.4 Subtitle

A subtitle (or caption) is a small text that appears on-screen and transcribes what the character or narrator is speaking. It is used in cases of translating foreign languages, making the dialogues more perceivable (if the narration is too fast or if the audience has hearing problems), or just providing information. A subtitle can be done in real-time, such as in live events or newscasts, or it can be processed after the movie is ready (offline captioning).

To see what comprises a subtitle file, a single file of this type can be downloaded and opened with Notepad, a text editor, or subtitle software. Movie captions in many languages can be found on websites such as subscene.com. As seen from examples below, a subtitle file is simply made of timecodes, each of which represents a subtitle line and specifically entails the exact time, the duration, and the text appearing onscreen. A person can create a subtitle file by writing the timecodes and dialogues in this way, using a text editor and saving it in the correct format. However, due to time constraints, finding help from subtitle generator software is much easier. Figure 34 is an interface of Aegisub, a subtitle editor.
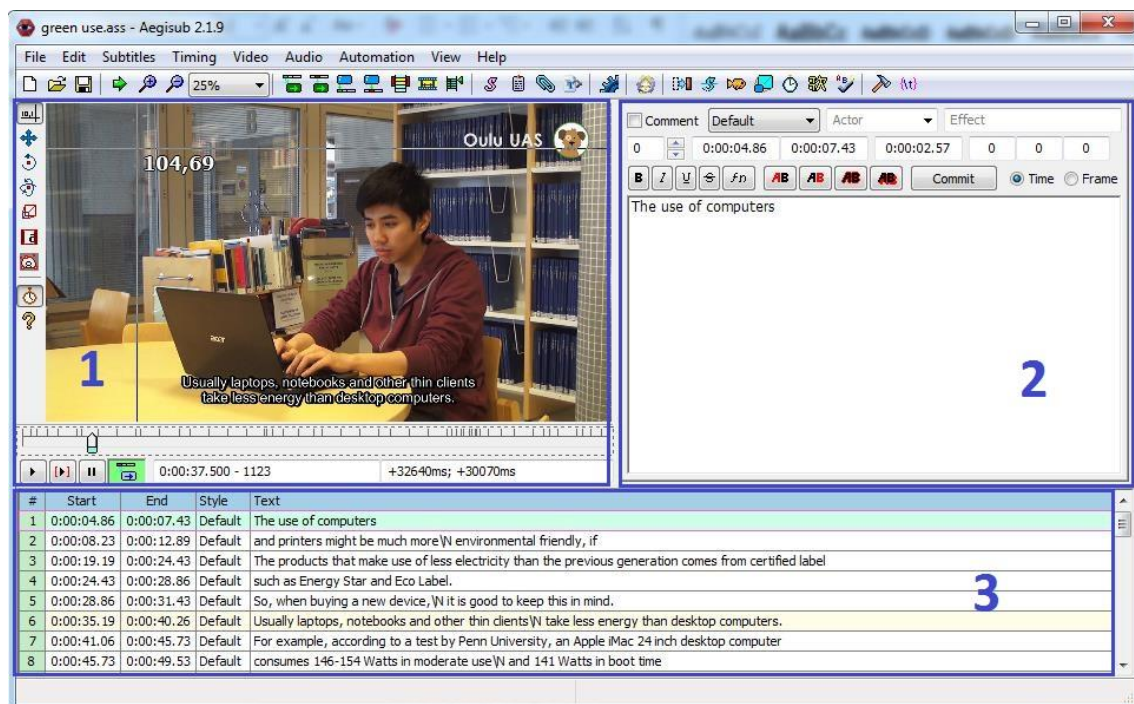

FIGURE 34. Aegisub interface

The interface of Aegisub can be categorized into three main parts as marked above, in addition to the menu bar on top and the tool bar on the left. The first section displays the video together with

the appearance of the subtitle, with indices of time or frame number. The second one is the input section where users can type in words or codes to manipulate the subtitle, e.g. fade in, fade out, slide from left to right following a certain coordinate, etc. The topmost line in section three (**comment**, **actor,** and **effect**) provides options for karaoke or complicated effects, which were not used in this project. Also, it specifies the style of subtitle, which is **default** in this case. The line right below it allows users to set the starting and ending times, duration, and text decoration of selected subtitle lines. The **Time** and **frame** options let users do it either by time or by frame. For the videos in this project, the author made subtitle based on time values. Finally, the third section displays all subtitle lines with necessary information. Users need to work in this section if they want to shift time, duplicate lines, or make a group of lines time-continuous, etc.

It is not difficult to learn how to make a basic subtitle file, but it takes more time to stylishly modify the text. Luckily, in this project, there was not a lot of complicated features to adopt, so the author only mentions the main functions that she used. The first one is **style**, which can be accessed through **Subtitle/Style Manager** from the menu bar. The screenshot of Style Manager Dialogue in Figure 35 illustrates this.

FIGURE 35. Style Manager Dialogue

People can change the text font, colour, size and save them collectively with a unique name, which can be chosen on the first line of section two. In addition, **margins** let users offset the position of the text. On the top right corner, the value **opaque box** puts a background behind the text to increase contrast. This is apparently useful if the video contains too many colours that make the subtitle hard to see. In this video, text size is the first to be changed, up to 60-65, because the default one is for lower resolution.

One of the common problems is when the original video changes, maybe longer or shorter at any point. It would be a burden to change every line to fit the new video. For example, when editing video *Air protection*, there were 60 lines of subtitle and the author needed to make a change from the 18th line. If she had edited the time of only that line, the following subtitles would have been messed up because of time overlapping. Instead, the author used the shift time function, which can be found at **Timing/Shift Times**, or Ctrl + I. It brings out the following dialogue in Figure 36.
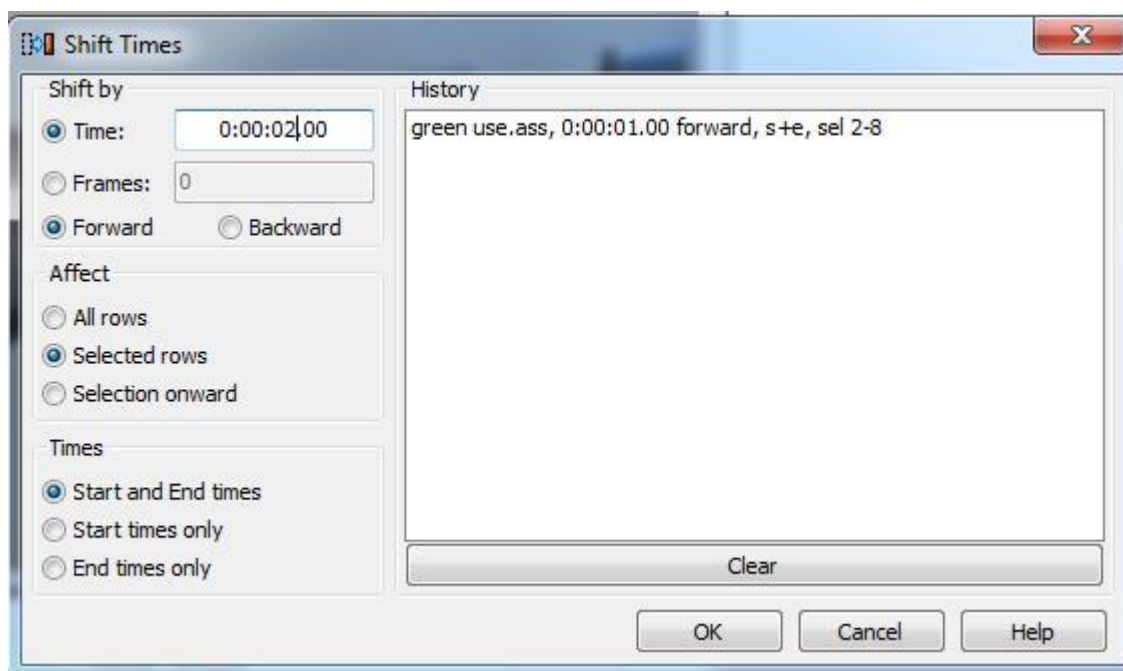

FIGURE 36. Shift Times dialogue

The function enables changing the times of all the lines or of only the selected ones, shifting them to be later or earlier in comparison with the current times. Thanks to this automation, all the author had to do was highlight line 19 through line 60 and shift them eight seconds forward.

Finally, when the users are satisfied with the subtitle, they can go to **File/Save Subtitles as...** to create a file with an **.ass** (Advanced Substation Alpha) extension. This can already be used as a normal subtitle file. In most cases, if a subtitle file is located in the same folder and shares the same name with the movie, the video player will automatically load the file and run it with the film.

6 CONCLUSIONS

This study was set out to explore the process of creating educational videos on sustainable development for OUAS. In other words, this paper answers the questions of how to make a short video. The outcomes of this topic include four videos of five minutes each and supportive information on video making process, such as script writing, camera, light settings, etc. The final clips are *Waste management*, *Reuse*, *Air protection* and *Green use of computers and printers*.

The study has been implemented through a research on the basics of cinematography and practical filming. Elements in filming such as using different camera angles, building a script and storyboard, etc. have been learnt through books and the Internet, as well as practiced to gain personal experience. Also, recommendations were collected from lecturers and friends. And shooting equipment was borrowed from the school.

This thesis has been structured by interweaving theoretical and empirical parts categorized into three stages of filming, namely pre-production, production, and post-production. In the first phase, the concepts of script, storyboard, film crew, and equipment have been discussed. The second one captures camera and light essentials. Finally, the post-production mentions the editing phase in which video editors Adobe Premier Pro and After Effects are at the centre of focus. Snapshots, scripts, and storyboards from the outcome videos have been selectively embedded in this paper as examples. The organization of content resembles that of a timeline-based diary, in which the author discusses her work step by step along with the problems she has dealt with. There is a strong relationship between theory and reality, as the former serves as the guide for the latter.

This study has been developed from work tasks and no new theoretical findings from making movies have been found. Instead, the thesis will be a supportive source for further video making on various topics, while the output videos may as well be used as visual materials for courses about sustainable development. Besides, it can be used by any academic courses (e.g. Video making course) if the teachers feel that the movie contents are suitable to be shown in their classes.

There will be links in OUAS's intranet under the section of sustainable development for the final short movies, so that all the teachers and students can easily access. Besides, the videos are

available on the author's Youtube channel. As a safe option, they will be stored in a CD-ROM and given to the commissioner in case the videos cannot be retrieved from the mentioned channel.

The videos can be accessed online at:

Waste management: http://youtu.be/VQ_HZvSY7Ag

Re-use: http://youtu.be/MOyxK2gzD9I

Air protection: http://youtu.be/7kUkRIXrfzM

Green use of computers and printers: http://youtu.be/NPyvkfmTux4

Closed captioning (CC) can be turned on for subtitles.

7 DISCUSSION

Overall, the objectives set for the student in this project are rational and the results are acceptable. The output videos are at a suitable length of five minutes per each and contain basic information as required. Their resolution quality also receives good evaluation.

Although I had been making a number of short clips before, this is the first time I get involved in such a project with several requirements from a commissioner. This gives me not only the pressure, but also the motivation to make the movies as good as I can. The job is demanding but rewarding. After finishing them, I feel very proud of the whole process and my efforts which have been invested in. Overall, the truth that together with the thesis, I have real products to show pleases me the most.

During the project, I had problems mainly due to a lack of pre-studies on cinematography theories. Video *Re-use* was the earliest shooting activity, and up to that time, only about a quarter of the theoretical parts had been studied. I wish I had known more when I filmed those footages, especially about lightings. For other videos, there have been more or less improvements. I have learnt that next time I should go from the theory first, before conducting any practical tryouts. Also, the pieces of filming equipment deserved more time to practice with, as in many instances they proved me a clumsy camerawoman.

Another value that I wish I had been able to adopt earlier is teamwork. Individual work was challenging and time consuming, when I had two cameras and only one body trying to take different angles. Also, without support, I had difficulties taking high camera angles. Above all, I think having at least one partner would have reduced the whole workload.

Soon I realized, that it was nearly impossible to work towards the best solutions. On the one hand, this required much more time; on the other hand, even though I thought it was the best, there were always a better way to do. Especially when I asked a number of persons how they thought about my videos, there were always new ideas. Some like, some dislike. Some propose a change in the soundtrack, some point out that my editing has flaws. Therefore, the best solution will be the one which meet the requirements of the commissioner and which I can give suitable reasons for choosing.

As a result from this study, I have learnt movie skills and techniques, from building a script and making the flow of storytelling, to editing footages. The knowledge gained from this is useful for my future career, as well as for now that I know how to use software such as Adobe Premier Pro and After Effects.

As time goes by, there will be out-of-date concepts that need to be rejected or modified, especially in a movie industry that generally follows the audience' taste. What I have written here is what I appreciate as the basics one should know as a beginner. As I noticed, cinematography is the kind of art in which opinions vary greatly. Therefore, although fairly useful for beginners, the knowledge in this paper only serves as a reference, a starting point for further skill development.

The content covered in this project only touches a small area in this huge topic of sustainable development, and there is plenty of room for more. Themes on economic or social pillars are highly recommended for future video and research projects.

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Opening animation: Ykä-koira avatar zooms in to the center of the screen in green background, text "Air protection" appears when the avatar slightly shrinks.

Movie: Small Ykä-koira avatar drops down from the top right, text "Oulu UAS" slides in from Ykä-koira avatar and they stay in a line.

Scene 1: ANIMATION

There are two separated lines of energy coming in and from the Earth, the coming-in line from the sun is growing bigger, a red line appears and alertly blinks around the Earth.

Voice over and subtitle: Global warming results from unbalance in temperature, due to unbalance in the planet's energy coming and leaving ratio. That also means, the temperature is high when the Earth holds too much energy from the sun without reflecting it back to the space.

Scene 2: ANIMATION

Zoom in the Earth from one point, showing volcano eruption. Switch to another point with tornadoes taking houses away. Switch again to another point, showing smelting ices.

Voice over and subtitle: This climate change may include huge natural disasters such as eruptions of volcano, storms, degradation of ocean habitats, and so on.

Scene 3: ANIMATION

Sun is shining hard on a tired people. Zooming out to see a crowd is lining to buy fans. The fans price is rising gradually.

Voice over and subtitle: Or just small things that make us discomfort.

Scene 4: TRAFFIC SCENE, DAYTIME

A lot of car traffic is going on.

Voice over and subtitle: Greenhouse gases are considered to be one of the elements that keep heat in the atmosphere and make the Earth surface warmer.

Scene 5: IN A KITCHEN

A pot is boiling hard on the stove.

Voice over and subtitle: Greenhouse gas comes from water vapour

Scene 6: AT THE AIRPORT, DAYTIME

A plane is landing on a quiet airport ground.

Voice over and subtitle: carbon dioxide, methane, nitrous oxide,

Scene 7: NEAR A FACTORY, GLOOMMY DAY

A shot on the factory's chimneys in a dark weather.

Voice over and subtitle: and other emissions from industrial processes.

Scene 8: Black background with text "Carbon dioxide"

Scene 9: AT A CARPARK, AT THE AIRPORT, DAYTIME

A car is leaving the parking place, a plane is going to take off.

Voice over and subtitle: Carbon dioxide is a prevalent greenhouse gas mostly caused by human's activities such as burning fossil fuel to serve transportation, industrial process and electricity provision.

Scene 10: ANIMATION

Half top of the screen: A car travels two way on a map on the route Helsinki - Oulu.

Half bottom of the screen: text animation: 116l gasoline = 272kg CO2

Voice over and subtitle: For example, a car goes from Oulu and Helsinki on a round trip may take about 116 litres of gasoline which produces 272 kg of CO2,

Scene 11: ANIMATION

The half bottom of the previous screen pushes up to become half top.

Half bottom of the screen is now: text "= 133kg COAL BURNED, 9 days HOUSEHOLD ENERGY, 0,633 barrels of OIL, 89kg WASTE".

Voice over and subtitle: equals to the amount of CO2 emit from 133kg of coal burned, the energy that one house use in 9 days, 0,633 barrels of oil, and equal to greenhouse gas emission from 89 kg of waste sent to the landfill.

Scene 12: ANIMATION

Half top of the screen: a flying airplane.

Half bottom of the screen: text "705 million tonnes of CO2".

Voice over and subtitle: The number is much larger with airplane. In 2013, an estimation of 705 million tonnes of CO2 was produced all over the world by flights.

Scene 13: OUAS

Students traveling to school by bicycle.

Voice over and subtitle: One solution is to avoid traveling by vehicles that do not use gasoline, for example bicycle.

Scene 14: ON THE PUBLIC ROAD, DAYTIME

A people is swinging with skateboard on the pavement.

Voice over and subtitle: Or even skateboard.

Scene 15: ANIMATION

Two people are talking enthusiastically over Skype

Voice over and subtitle: Another method is taking advantages of technology advances, for example using Skype or Google hangout to contact with people from far away when possible.

Scene 16: Black background with text "Methane"

Scene 17: ANIMATION

One piece of metal equals to 30 pieces of carbon dioxide

Voice over and subtitle: Methane is 30 times more potent than carbon dioxide in terms of keeping heat.

Scene 18: N/A

Lake scene

Voice over and subtitle: Methane emits from manure management, fossil-fuel, landfills, natural gas, petroleum system, and even in freshwater. When the temperature rises, the methane emits into the atmosphere also increases.

Scene 19: AT A FARM, A HORSE CAMP, DAYTIME

The cow is kept inside a house and eating. A house is standing in the horse camp eating grass.

Voice over and subtitle: In agriculture, animal digestion process produces a large amount of methane.

Scene 20: COMPUTER SCREENSHOT

Zoom in a website with the titles, and the details.

Voice over and subtitle: Let's have a look at this practical example in Germany:

http://www.nydailynews.com/news/world/farting-cows-blow-barn-build-methane-article1.1594986

According to the police, nearly one hundred cows had produced such high methane gas

level by their farting and belching that set the barn on fire.

Scene 21: ANIMATION

Operation of a hamburger to see 133 gr of beef, dividing into 3kg of grains, 200 liters of water, 7 square meters of land and 1036 Btu of fossil fuel, equals to 18 minutes of microwave power.

Voice over and substitute: In addition, raising animals require more energy, food, water and land as fossil fuel, farm factory activities, etc. For example, for about 133 grams of beef in a hamburger, it takes 3 kg of grains, 200 liters of water, 7 square meters of land to grow crops and 1036 Btu of fossil fuel for transportation and feed production, which equals to 18 minutes of microwave power.

Scene 22: ANIMATION

A series of pie chart appears onscreen to show data

Voice over and substitute: According to United Nations Food and Agriculture Organization report in 2013, the amount of greenhouse gases emit from livestock sector occupies 14.5% of all greenhouse gas released by human activities. While beef and cattle milk production takes up 41% and 20% of emissions from livestock; pig meat, poultry meat and eggs only account for 9 and 8 percent.

Scene 23: ANIMATION

A cross to dismiss hamburger.

Voice over and substitute: Consequently, eating less hamburgers

Scene 24: ANIMATION

A plate with more green and organic foods such as banana, vegetables, onion, garlic, tomato and carrots.

Voice over and substitute: and adopting a greener diet with more green things, less amount of meat, may help reduce the amount of animal to be raised, decrease the consumption, amount of methane gas and other emissions coming from their manure and farming factory activities.

Scene 25: BLACK SCREEN WITH TEXT

"Green the meal, green the day"

Black screen running credits e.g. author, camera man, etc.

Avatar Ykä-koira appears one more time. End of video.

Opening animation: Ykä-koira avatar zooms in to the center of the screen in green background, text "Re-use" appears when the avatar slightly shrinks.

Movie: Small Ykä-koira avatar drops down from the top right, text "Oulu UAS" slides in from Ykä-koira avatar and they stay in a line.

Scene 1: FLOWER SHOP, MORNING

Ella is slowly looking for a tiny plant among numerous colourful flowers in a small quiet outdoor flower shop. Suddenly a message from her friend suggests coming at once to event "Take it or leave it".

Scene 2: OUAS's CORRIDOR B, MORNING

Paolo shows interest in the "Take it or leave it" poster that he suddenly notices on the way to the library on a dense bulletin board.

Scene 3: DENIS's MAILBOX, MORNING

In a narrow walkway of a PSOAS student house, on the way to his room, Denis wearily checks his mailbox, which is full of colourful magazines and newspapers.

Scene 4: DENIS's ROOM, MORNING

Denis tosses a newspaper onto his existing pile of magazines and heavily plops down into a chair. He skims through Oiva's notifications and carefully reads "Take it or leave it" information. Denis hurriedly checks the time.

Scene 5: OUAS BICYCLE AREA NEAR HALL A, MORNING

Hans brings a square carton of unnecessary objects including shoes, light bulbs, clothes, and cables to school by bicycle in a nice summer morning. After leaving the bike, he brings the carton into Hall A, then quickly unpacks and classifies them into the correct places.

Camera stops on the student's way to catch the school's name board.

Scene 6: HALL A, DAYTIME

Groups of students are checking and taking objects from the event.

Scene 7: HALL A, DAYTIME

Paolo leisurely walks along tables of re-use things and finally found the wires. He happily places those tidy-rolled Internet cables into his backpack.

Scene 8: HALL A, DAYTIME

Denis excitedly digs at the mess of clothes before finding a large checked wool scarf. Also, he takes the belt after considering its length and toughness.

Scene 9: HALL A, DAYTIME

Ella pays attention to the light bulbs and goes deep in thoughts. She enigmatically smiles and decides to take them.

Scene 10: HALL A

Three scenes of Ella, Denis and Paolo taking useful things coming as small parts of one frame.

Scene 11: PAOLO's ROOM, DAYTIME

Paolo energetically enters his room and quickly places the wires on the table. He professionally connects the wires with his Wi-Fi adapter and successfully installs it on his laptop. Then, he carefully rolls the wires and places them neatly into the toilet paper's cores with four existing other cables.

Scene 12: DENIS's ROOM, DAYTIME

Denis swiftly rolls a lot of magazines and newspaper into long hard sticks and fixed each of them with transparent tapes. He strongly tights the belt and shoe laces around to shape them into a cylindrical chair, covers it with the wool scarf and places a lamp onto it.

Scene 13: ELLA's ROOM, DAYTIME

Ella enthusiastically wears protection stuffs including gloves, glasses and mouth protectors to fix the light bulbs. She carefully breaks its plastics and slowly pulls out the filaments. After cleaning and filling the light bulb with water, she happily places small flowers into the shiny "light bulb vases".

Scene 15: BLACK SCREEN WITH TEXT

"People are reusing. How about you?"

Credits running e.g. author, camera man, etc.

Avatar Ykä-koira appears one more time. End of video.

Opening animation: Ykä-koira avatar zooms in to the center of the screen in green background, text "Waste management" appears when the avatar slightly shrinks.

Movie: Small Ykä-koira avatar drops down from the top right, text "Oulu UAS" slides in from Ykä-koira avatar and they stay in a line.

Scene 1: OUAS TRASH AREA, MORNING

Employees from the L&T Company are familiarly taking huge trash packets with from the bins into a big garbage truck.

Voice over and subtitle: Wastes are valuable resources. After being thrown away, they travel a long way before coming back and have impact on human life.

Scene 2: WALLU RESTAURANT, LUNCH TIME

There are leftovers on a student's plate. Another student is blowing her nose with a piece of paper.

Voice over and subtitle: Leftovers, dirty papers,

Scene 3: OULUN TYÖSTÖKESKUS COMPANY's CORRIDOR

An employee carefully throws a heavy box of aluminium into the particular trash for renewable metals.

Voice over and subtitle: Metal,

Scene 4: N/A

Glass bottle of wines are standing on the table.

Voice over and subtitle: glasses, and so on.

Scene 5: OULUN TYÖSTÖKESKUS COMPANY's CORRIDOR

Lines of big garbage bins for renewable metals.

Voice over and subtitle: can be recycled into useful things, as well as power and heat generation if they are correctly classified.

Scene 6: COMPUTER SCREEN

Screenshots of "Plastic shopping bags make a fine diesel fuel, researchers report" article on the Internet.

http://news.illinois.edu/news/14/0212bags_oil_BrajendraKumarSharma.html

Voice over and subtitle: Voice-over and subtitle: for example, plastic bags, which are considered hazardous and promotes throw-up culture, now involves in the process of producing petroleum products such as diesel, engine oil, natural gas, and so on.

Scene 7: OULUN TYÖSTÖKESKUS COMPANY, CORRIDOR

There are big places of aluminium inside the garbage bin.

Voice-over and subtitle: Metals, by contrast, contributes to the materials that build up infrastructure,

Scene 8: N/A

A tin can showing "Pantti" lines.

Voice over and subtitle: for example tin can,

Scene 9: A CAR PARK, DAYTIME

Cars at the car park.

Voice over and subtitle: auto parts,

Scene 10: A BRIDGE, DAYTIME

Bridge parts, sided with a lot of traffic going on.

Voice over and subtitle: bridge parts, and so on, thereby, we can decrease environment exploitation through mining, because metals are easy to recycle.

Scene 11: SCREENCAST VIDEO

There are a lot of results displayed when searching with keyword "recycling" from Youtube. A click on "Recycling plastic bottles" opens a new video showing an industry of plastic bottles recycling. One more example with glasses.

Voice over and subtitle: just type in "recycle", people can find lots of information about different materials' recycling, for example plastic bottles.

http://www.youtube.com/watch?v=6R8YObQbE88

Scene 12: BLACK SCREEN

Voice over and subtitle: But, the question is, how to correctly classify the waste?

Scene 13: OUAS, DAYTIME

Four shots on OUAS's overview, Hall A, Corridor B and Wallu restaurant

Scene 14: WALLU RESTAURANT, LUNCH TIME

A group of students are enjoying lunch while talking energetically in a full Wallu restaurant.

Scene 15: WING B, SECOND FLOOR, SOFA NEAR ROOM B248, DAYTIME

Anton is leisurely reading books and drinking water in a paper cup on a sofa in shining lights.

Scene 16: ROOM B328, DAYTIME

Lucy is printing out her lecture slides in an ATK room.

Scene 17: WALLU RESTAURANT

The clock ticks 12:00. The group of students stop eating and swiftly line up to the garbage to deliver their leftovers, dirty plates and cutleries. Leftovers are thrown to the right bin, and dirty papers go to the left. Text on frame: "For food" and "For paper" respectively.

Scene 18: WING B, SECOND FLOOR, SOFA NEAR ROOM B248, DAYTIME

Anton lazily checks the time. He drinks the rest of the water and throws it into the small trash bin in the corner.

Scene 19: WALLU CORRIDOR

Hanna naturally throws the dirty papers into one of the four trash bins in the restaurant corridor. A camera pan shows the labels of them.

Scene 20: ANIMATION

Text: Waste from metal

Icons appear piece by piece: (Horizontal line) a canned food, a beverage can, a glass packaging lid, a dry paint can. A v tick at the beginning of the horizontal line. Sound "Ding".

Scene 21: ANIMATION

Text: Waste from glass

Icons appear piece by piece: (Horizontal line) a white glass bottle, a green glass bottle, a brown glass bottle. A v tick at the beginning of the horizontal line. Sound "Ding". Second horizontal line:

A broken ceramics plate, an window glass. A x tick at the beginning of the horizontal line. Sound "EEEE".

Scene 22: ANIMATION

Text: Waste from food

Icons appear piece by piece: (Horizontal line) a chicken leg, an egg carton, a piece of paper, a coffee filter. A v tick at the beginning of the horizontal line. Sound "Ding". Second horizontal line: A plastic bag, a cigarette, a water drop, a foil. A x tick at the beginning of the horizontal line. Sound "EEEE".

Scene 23: ANIMATION

Text: Burnable waste

Icons appear in first line: fire. A v tick at the beginning of the horizontal line. Sound "Ding". Second line: recyclable. A x tick at the beginning of the horizontal line. Sound "EEEE".

Scene 24: ROOM B328, AFTERNOON

Lucy notices that there is no papers left. She rummages in vain through her backpack for more papers. She starts collecting the papers which are left by earlier students, taking white papers (one or two sided) apart and uses them for printing. After all, she closes the computers, printers and lights before departing.

The video screen fades off as the light fades off.

Scene 25: BLACK SCREEN WITH TEXT

"Don't waste the waste".

Black screen running credits e.g. author, camera man, etc.

Avatar Ykä-koira appears one more time. End of video.

Opening animation: Ykä-koira avatar zooms in to the center of the screen in green background, text "Re-use" appears when the avatar slightly shrinks.

Movie: Small Ykä-koira avatar drops down from the top right, text "Oulu UAS" slides in from Ykä-koira avatar and they stay in a line.

Scene 1: B248, DAYTIME

Ákos is using a computer in a quiet room.

Voice-over and subtitles: Computer,

Scene 2: B328, DAYTIME

A printer is printing

Voice-over and subtitles: and printer are two among many devices that will live longer if they are treated correctly.

Scene 3: Black title: *"#1: Look for certified label when purchasing a computer device"*

Scene 4: Images of Energy Star and Eco Label

Voice-over and subtitles: The products that make use of less electricity than the previous generation comes from certified label such as Energy Star and Eco Label. So, when buying a new device, it is good to keep this in mind.

Scene 5: Image of a product that has Energy Star label

Scene 6: Black screen: "#2: Use laptop when possible"

Scene 7: LIBRARY, DAYTIME

Thong is sitting in the library using his laptop.

Voice over and subtitles: Usually laptops, notebooks and other thin clients take less energy than desktop computers.

Scene 8: ANIMATION

Screen displays two computers' information and numbers.

Voice over and subtitles: For example, according to a testing by Penn University, an Apple iMac 24 inch desktop computer consumes 146-154 Watts in moderate use and 141 Watts in boot time;

while an Apple MacBook Pro 13 inch notebook only uses 58-60 Watts in moderate use and 52 Watts in boot time. It can save more than a half of the energy used.

https://secure.www.upenn.edu/computing/resources/category/hardware/article/computer-power-usage

Scene 9: LIBRARY, DAYTIME

Continue of scene 7 with a close up to computer's battery place.

Voice over and subtitles: Also, as an advantage over desktop computer, laptop was equipped with batteries that can run several hours without electricity. This particularly nice with students.

Scene 10: Black screen: "#3: Be familiar with Power saving options".

Scene 11: B328, DAYTIME

Thong is turning the brightness of a computer down.

Voice over and subtitles: When you are working, set your working monitor's brightness to the minimum that avoids your eyes to be tired fast.

Scene 12: ANIMATION

Line up text: Power saving mode, Standby/sleep mode, Hibernation. V tick at the beginning.

Line up text: Screensavers. A x tick at the beginning.

Voice over and subtitles: Other than brightness level, electricity consumption have friends, and foe.

Scene 13: SCREENCAST

Showing the steps of changing power settings

Voice over and subtitles: To see your current power settings, go to Control Panel, Power Options. For more details, click on "Changes Battery Settings". You can see and modify the duration that the computer will become dim, or the monitor is closed down, or computer to bet set to sleep. More options can be found at "Choose what the power button does", where you can set a schedule for a lot of other devices, such as hard drives.

Scene 14: Black screen: "Sleep mode & Hibernation options"

Scene 15: B248, DAYTIME

Ákos is surfing the Internet when he suddenly has a phone call. Ákos turns the computer to sleep mode before going out with his phone. When he comes back, Ákos presses the power button to wake the machine up in its original state.

Voice over and subtitles: Setting computer to sleep mode when you are away for short periods may save 60-70% of power.

Scene 16: ANIMATION

Difference between Hibernation and Sleep mode

Voice-over and subtitles: Hibernation is different from sleep mode. It does not put the machine into sleeping, instead, it writes the current state of the computer into a temporary file before shutting it down. So if you are using laptop battery, hibernate mode does not consume the battery like sleep mode, therefore avoid losing data when the laptop is suddenly turn off.

Scene 17 : Black screen: "No screensavers"

Scene 18: ANIMATION

A computer screen with changing pictures resemble screensavers. A cross goes to deny it. The screen turns into black and white.

Voice over and subtitles: Screensavers, unluckily does not contribute to power save.

Scene 19: SCREENCAST

Showing how to turn Screensavers off.

Voice over and subtitles: To turn it off, you can right-click to any place in the desktop, choosing Personalization and go to Screensavers, setting it to No screensaver. Other way can be done through Control Panel, Appearance and Personalization, Personalization and then Screen Saver to bring us to the same destination..

Scene 20: Black screen: "#4: Turn devices off after using at the end of the day"

Scene 21: B328, DAYTIME

Ngoc is printing her documents in a computer room. After printing, she closes computer down, turn the printer and lights off before getting out of the room.

Scene 22: Black screen: "#5: Use a power strip"

Scene 23: IMAGE of an extension cord

Voice over and subtitles: An electricity extension cord with a power switch is effective for central turn-off point.

Scene 24: HOME, NIGHT TIME

A people is turning the power strip with many plug-ins off.

Voice over and subtitles: By using a power strip, you can be sure that all the digital devices no longer in use.

Scene 25: Black screen: "#6: Save the printer"

Scene 26: B328, DAYTIME

A printer is printing. A student is sorting out the pages that are only used in one side, and take them aside to re-use them.

Voice over and subtitles: For a printer, take advantages of both blank pages by using a double-sided printer, or just sort out the blank page and use them

Scene 27: LIBRARY, DAYTIME

A student is reading lecture slides alone at a corner of the library.

Voice over and subtitles: If you need to print out lecture slides, try to print several slides in one page. These will save papers.

Scene 28: SCREENCAST

Voice over and subtitles: This can be done by choosing Zoom/Page per sheet in the Printer option dialogue.
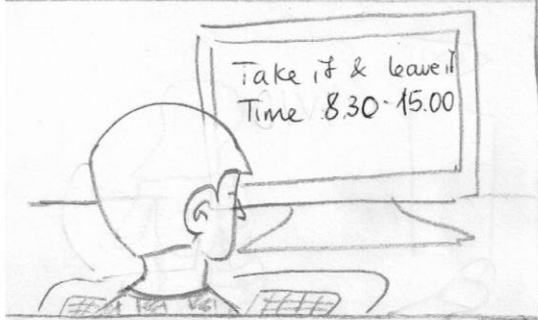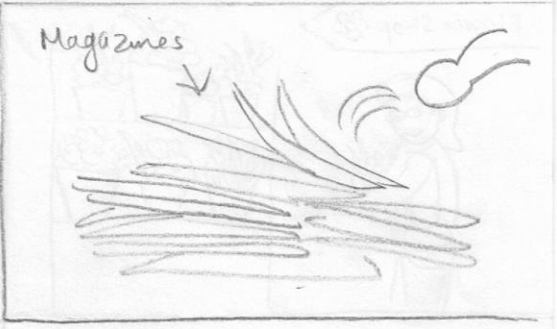
Scene 29: Black screen: "Use your devices greenly."

Black screen running credits e.g. author, camera man, etc.

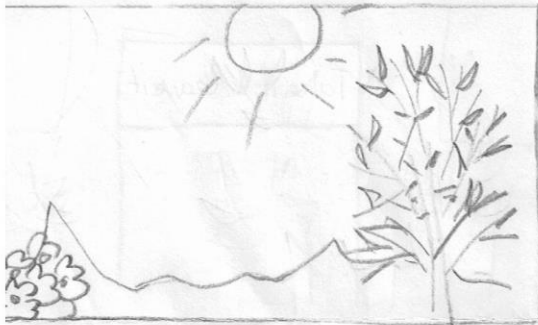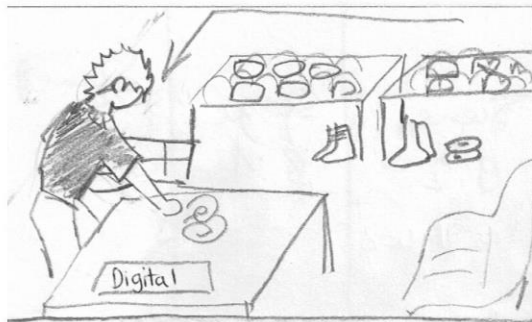*Avatar Ykä-koira appears one more time. End of video.*
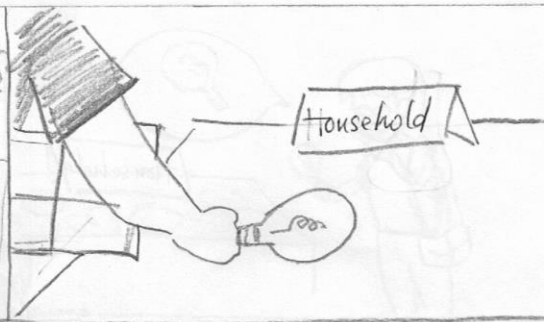
Scene 4 . Denis's room

Magazines

Take it & leave it
Time 8.30 - 15.00
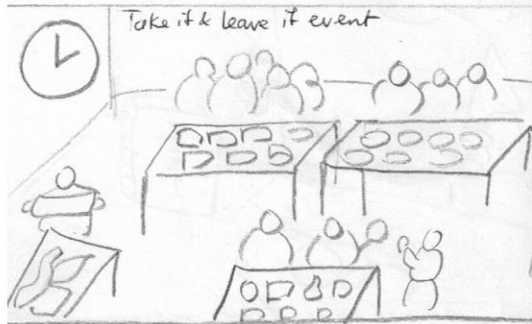
Scene 5

Hall A

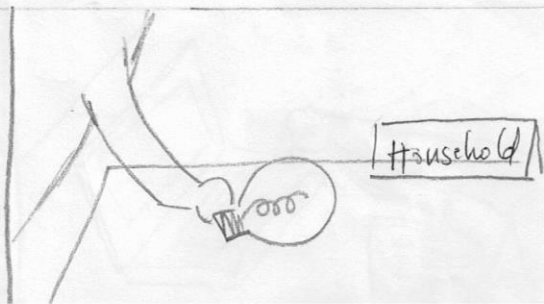Clothes
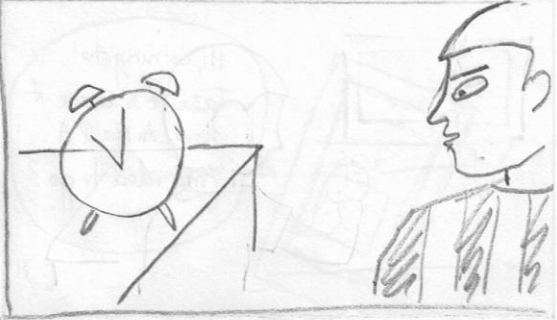
Scene 6. Hall A

Scene 7.1 Hall A

Scene 7.2 Hall A

Scene 8.1 Hall A

Scene 8.2 Hall A

Scene 9.1. Hall A

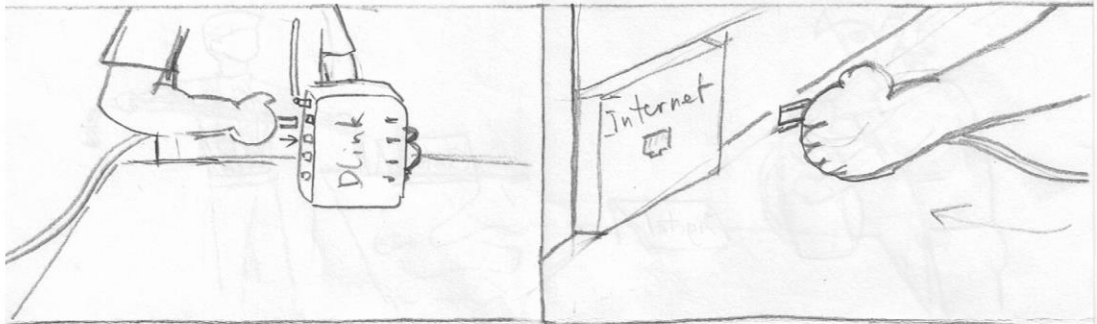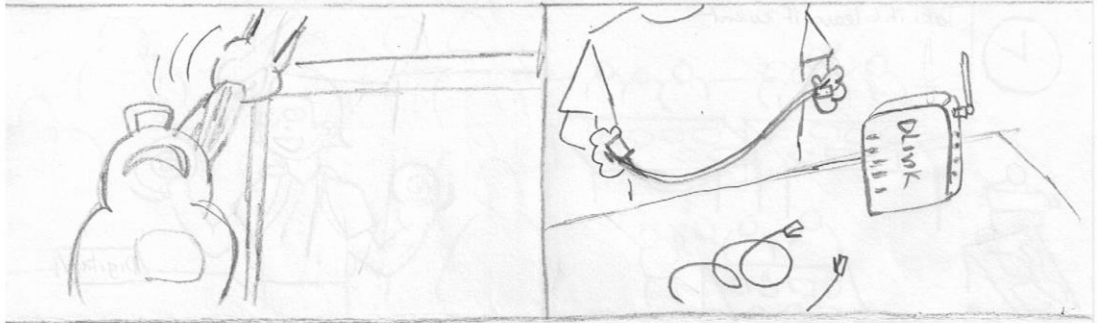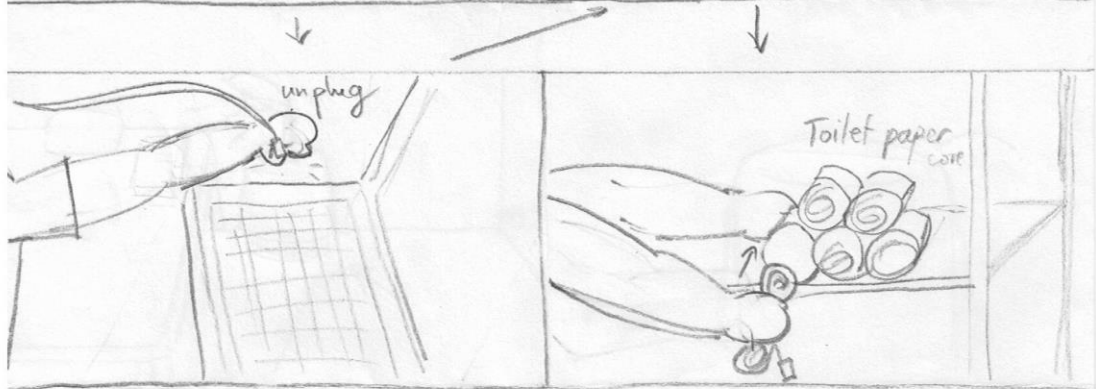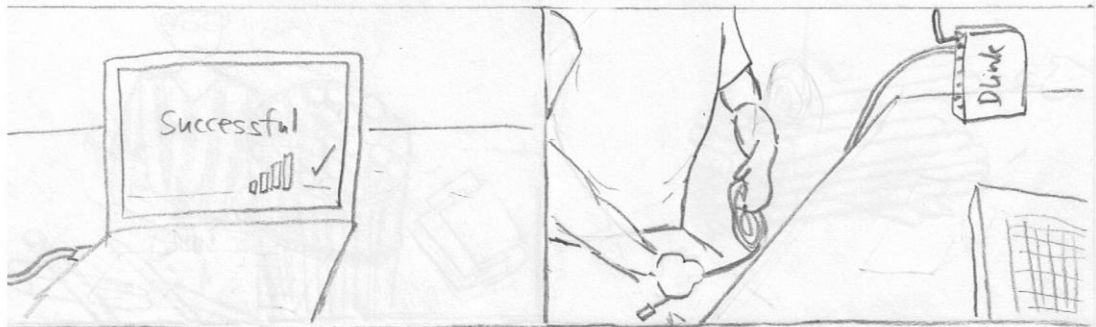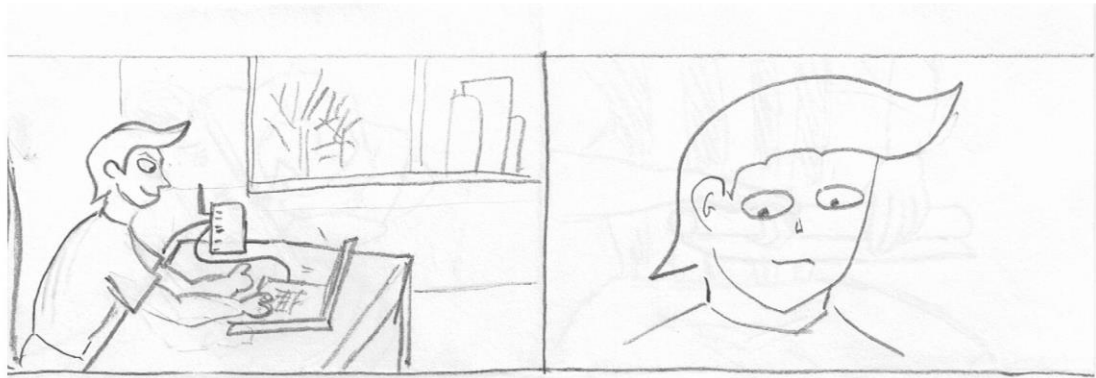Scene 9.2. Hall A

Scene 10

Scene 9.2 Scene 8.1 Scene 7.1

Scene 11. Paolo's room

Successful

Dlink

unplug

Toilet paper core
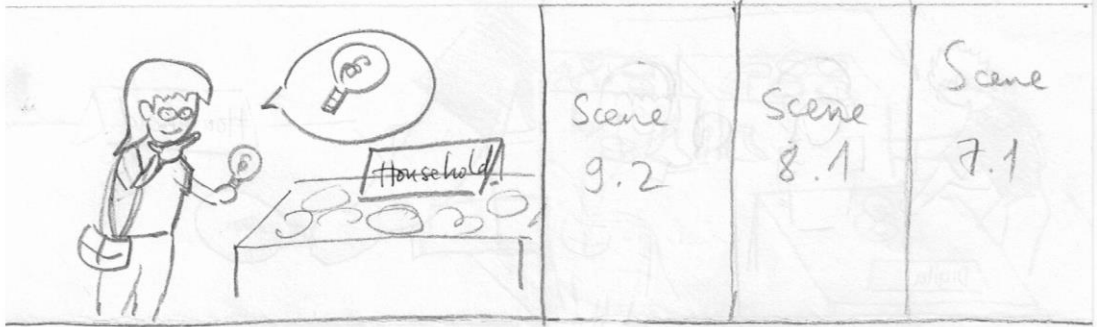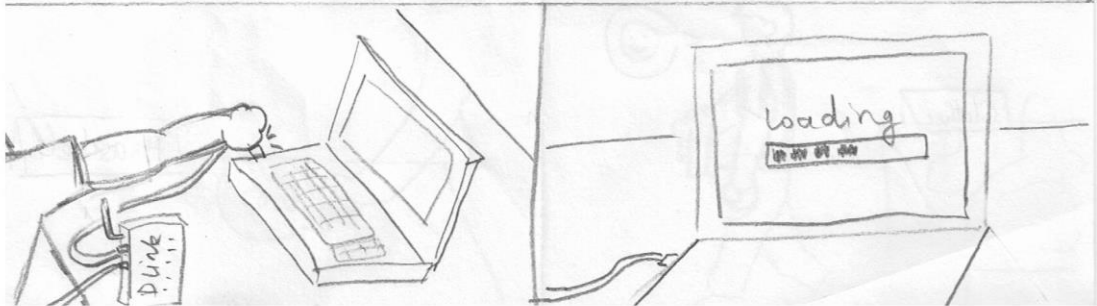
Scene 12   Denis's room

...
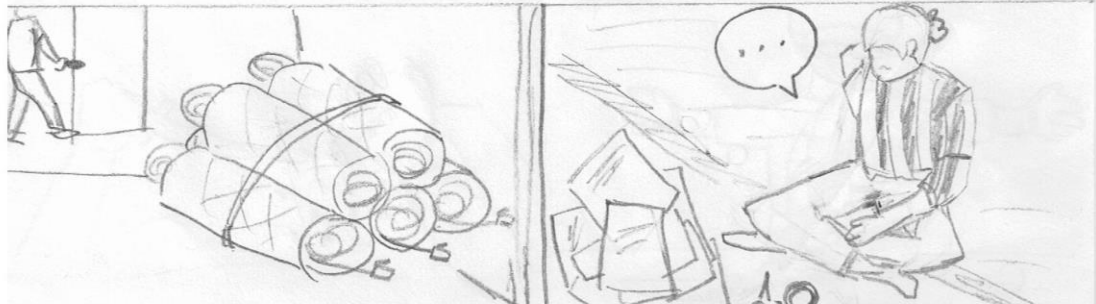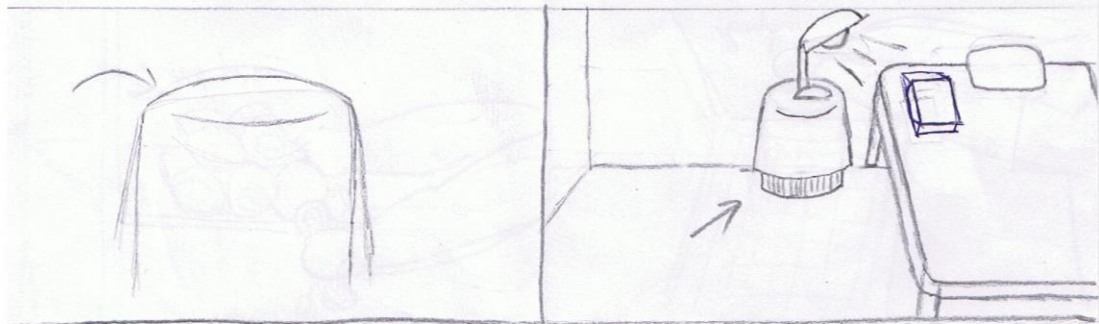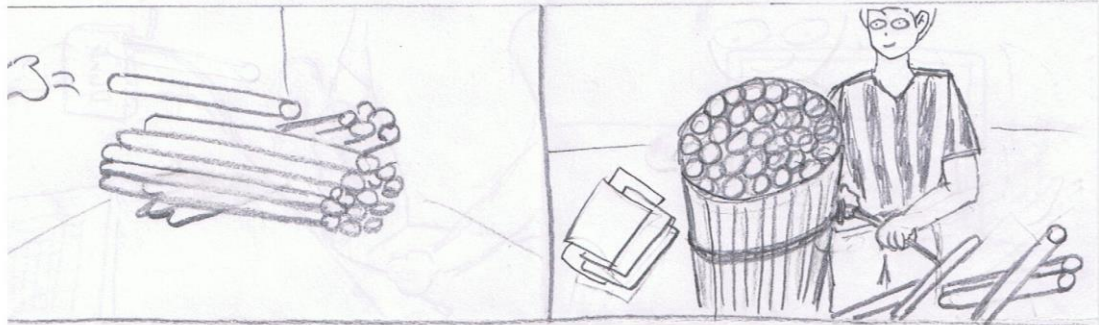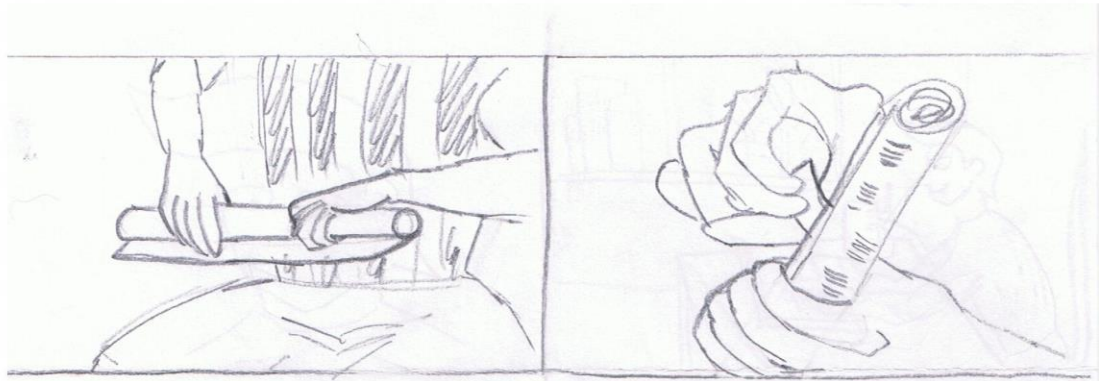
Scene 13 Ella's room
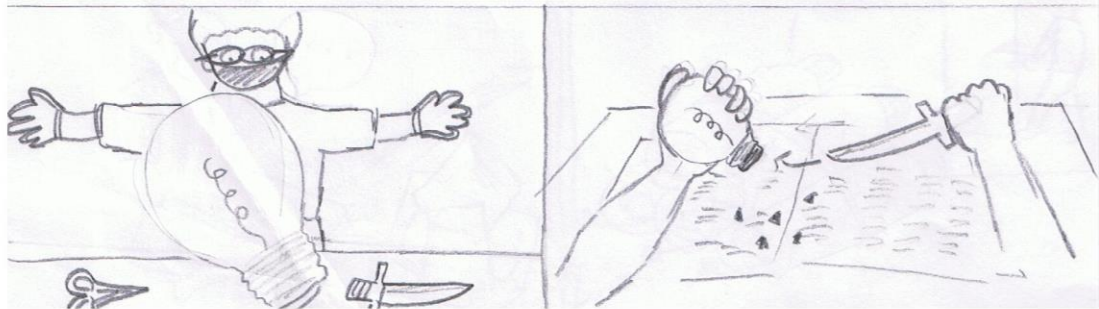
Air conservation
Scene details and shooting schedule

Scene number	Number of shots	Duration (second)	Location	Properties	Actors	Special form	Shooting date	Done
Title	1	5					Edit process	x
1	1	20						x
2	1	10				Animation	Edit process	x
3	1	8						x
4	2	8	Erkola bridge				17/05/2014	x
5	1	3	Kitchen	A boiling pot			07/05/2014	x
6	2	5	Airport				17/05/2014	x
7	1	5	Factory					x
8	1	5				Black screen	Edit process	x
9	2	10	Carpark, airport				17/05/2014	x
10	1	10						x
11	1	15				Animation	Edit process	x
12	1	10						x
13	1	8	OUAS				07/05/2014	x
14	1	5	Roadside				Not decided	x
15	1	10				Animation		x
16	1	5				Black screen	Edit process	x
17	1	8				Animation		x
18	2	18	Lake				17/05/2014	x
19	2	10	Farm	Horse, cow			18/05/2014	x
20	2	10				Screenshot		x
21	1	30						x
22	1	25				Animation	Edit process	x
23	1	3						x
24	1	25						x
25	1	5						x
Credits	3	20				Black screen		x
End	1	3						x
Total	35	299						

			Re-use					
			Scene details and shooting schedule					
Scene number	Number of shots	Duration (second)	Location	Properties	Actors	Special form	Shooting date	Done
Title	1	5					Edit process	x
1	6	18	Flower shop near Prisma	Mobile phone	Sonja		22/05/2014	x
2	4	15	B corridor		Tan		07/05/2014	x
3	4	10	Thong's mailbox and room	Magazines (a lot)	Thong			x
4	5	15			Thong	Computer image	Edit process	x
5	8	25	Hall A	Bicycle, helmet, carton, shoes, clothes, light bulb (2), cables (2), belt	Hiep		07/05/2014	x
6	1	5			3 ~ 6			x
7	2	13		Cables (2)	Tan			x
8	2	13		Belt	Thong			x
9	3	13		Light bulb	Sonja			x
10	1	5			Tan, Thong, Sonja		Edit process	x
11	12	45	Anh's room	Cables (2), toilet paper cores (5), wifi adapter,	Tan		10/05/2014	x
12	15	45	Thong's room	Belt, scissors, tapes, magazines (a lot), shoe laces	Thong		24/05/2014	x
13	16	45	Anh's room	Flowers, light bulbs (2), scissors, gloves, mouth protection, glasses	Sonja		22/05/2014	x
14	1	5						x
Credits	3	20				Black screen	Edit process	x
End	1	3						x
Total	84	300						

SHOOTING SCHEDULE – WASTE MANAGEMENT

APPENDIX 8

Waste management
Scene details and shooting schedule

Scene number	Number of shots	Duration (second)	Location	Properties	Actors	Special form	Shooting date	Done
Title	1	5					Edit process	x
1	5	10	Oulu UAS trash area		L&T employees		13/05/2014	x
2	2	7	Wallu	Food plate, napkin	Akos, Nhung		16/05/2014	x
3	2	6	Oulun Tyostokeskus company		Employer		03/05/2014	x
4	1	3	Home	Empty glass bottle			07/05/2014	x
5	3	6	Oulun Tyostokeskus company				03/05/2014	x
6	2	20		Website link		Screencast	Edit process	x
7	1	5	Oulun Tyostokeskus company				03/05/2014	x
8	1	3	Home	A tin can			07/05/2014	x
9	1	4	Tilitie car park				08/05/2014	x
10	1	10	Erkola bridge					x
11	4	16	Youtube website			Screencast	Edit process	x
12	1	5				Black screen		x
13	4	15	OUAS, Hall A, Corridor B, Wallu				13/05/2014	x
14	5	10	Wallu		Ngoc Anh, Nhung, Trang		15/05/2014	x
15	2	10	B248 sofa	A paper cup of water	Akos			x
16	5	15	B328	Lecture slide, papers	Ngoc		16/05/2014	x
17	5	15	Wallu		Ngoc Anh, Nhung, Trang		15/05/2014	x
18	5	15	B248 sofa	A paper cup of water	Akos		16/05/2014	x
19	1	5	Wallu corridor	Dirty paper (1)	Nhung			x
20	1	8						x
21	1	15				Animation	Edit process	x
22	1	15						x
23	1	8						x
24	8	40	B328	Lecture slide, papers	Ngoc		16/05/2014	x
25	1	6						x
Credits	3	20				Black screen	Edit process	x
End	1	2						
Total		299						

109

Green use of computers and devices
Scene details and shooting schedule

Scene number	Number of shots	Duration (second)	Location	Properties	Actors	Special form	Shooting date	Done
Title	1	5				Animation	Edit process	x
1	1	3	B248		Akos		19/05/2014	x
2	1	5	B328	Papers			16/05/2014	x
3	1	3				Black screen	Edit process	x
4	1	13				Image		x
5	1	3	B248				N/A	x
6	1	3				Black screen	Edit process	x
7	3	15	Library	Laptop	Thong		16/05/2014	x
8	1	24				Animation	Edit process	x
9	2	10	Library	Laptop	Thong		16/05/2014	x
10	1	3				Black screen	Edit process	x
11	2	10	B328		Thong		16/05/2014	x
12	1	10				Animation		x
13	1	20				Screencast	Edit process	x
14	1	5				Black screen		x
15	8	30	B248	Mobile phone	Akos		19/05/2014	x
16	1	20				Animation		x
17	1	3				Black screen		x
18	1	8				Animation	Edit process	x
19	1	15				Screencast		x
20	1	5				Black screen		x
21	7	15	B328	Papers	Ngoc		16/05/2014	x
22	1	5				Black screen	Edit process	x
23	1	10	Home	Extension cord		Image	03/05/2014	x
24	1	8	Home	Extension cord			03/05/2014	x
25	1	3				Black screen	Edit process	x
26	5	10	B328	Papers	Ngoc		16/05/2014	x
27	2	6	Library	Lecture slides	Nhung		16/05/2014	x
28	1	10				Screencast		x
29	1	3				Black screen	Edit process	x
Credits	3	20						x
End	1	3				Animation		x
Total	55	306						