

The Dreamgazer

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The Effectiveness of Child Participation in the Production of Educational Films

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AN **UNIVERSE AWARENESS** FILM DIRECTED BY **REMCO VAN SCHADEWIJK** ASSISTANT DIRECTOR **ROBIN KLEIAN**
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Foreword

Three years ago I would never have thought I would once be able to direct a short film, combining my passion for storytelling and science. It has been a tremendously rewarding experience made possible by a great many people whom I am deeply indebted. The list of these people would be too long to mention here, but I would kindly refer you to the credits of the work that culminated from our combined efforts: 'De Dromenkijker'.

The project has inspired me to continue working in scientific film with a focus on bringing narrative storytelling to scientific films.

Truly, it has been a fantastic experience.

Leiden, 08/06/2016

Abstract

Child participation is a novel way of producing educational content for children. This research presents a combined approach of child participation based storytelling and professional production quality. The approach has been tested for its effectiveness in creating educational films for children. Child participation is an effective tool for the production of educational films for children. The inspirational power of narrative scientific films can be an effective addition to the toolkit of science educators around the world. Child participation dictates equality between adults and children in project decision-making based upon the United Nations' bill of child rights. This research report accompanies the release of the short film 'De Dromenkijker' produced by Universe Awareness, Leiden University. Seven children engaged in discussion with a film director during five weeks, starring in their own film about astronomy. Story writing, budgeting, production, post-production as well as recommendation for similar project are discussed in this report.

Introduction

The Universe is a wonderful place and awareness of its grandeur by children even at a young age is conducive to their upbringing. Learning about the cosmos can increase awareness, understanding and appreciation of science and technology. As Ödman-Govender puts it eloquently: 'the view of Earth from space without real borders between countries helps young children develop the skills and values that will help them create a better future for themselves' (1). Beyond this, many practical applications can be found in timekeeping and understanding the environment around us (2). Astronomy can also be used to provide vivid examples that help explain physics and the whole world around us (3).

Teaching astronomy is therefore of great interest to science educators. Furthermore, there is a wealth of knowledge on the level of understanding children have on basic astronomy. The counterintuitive explanations for every-day occurrences such as night and day and seasons elicits a strong interest in child development of scientific and logical reasoning. (4). Most research focusses on child understanding of a number of 'Big Ideas' as categorised by the American Association for the Advancement of Science (AAAS) (5). These Big Ideas are based on strand maps, a graphical representation tool for curriculum development, also by the AAAS. Their usefulness lies in showing interconnections and development over time between different topics, something which more traditional 'themes' categorisation is less able to do.

Due to its strongly visual nature, astronomy benefits greatly from audiovisuals. Indeed, video has been part of the education of school children soon after the advent of television, becoming especially widespread when VHS based systems became affordable for school use. At the same time however, the consumption of such video content is often a passive activity. Such passive consumption is a strong hindrance to efficient learning but endemic in many schools (6). It stands to reason then, that there is still plenty room for improvement. Researchers have investigated various novel uses for video, for example as a tool for self-reflection (7)

A more recent development is the recognition of children's influence on their own learning processes. Ever since the United Nations Convention on the Rights of the Child, appreciating and even using the input of children has been slowly on the rise. (8)

It has resulted into what is now commonly called 'participation' projects, of which there are many examples in the video field (7,9). Almost all of these projects have in common that they are meant for children to participate in the actual production. The end resulting videos are usually, though not always, publically available. Through the better alignment offered by participation of educational material to the worldview experienced by children, there could be improved learning experiences from video material.

In order to develop a modern approach to video based education these concepts have to be tested and evaluated to reach an optimal way of engaging children in learning and producing educational content. Though the presented research has astronomy as its subject, the results could well be applicable in the broader field of audio-visual education.

It is because of the aforementioned reasons that Universe Awareness (UNAWA) has chosen to produce a participatory based short film production on astronomy, combining the far reaching potential of film with the innovative method of child participation film projects.

Theoretical Background

The participatory method has been gaining traction among educators ever since the pioneering work of Hart (10). Principles of the participatory model have been applied to such things as museums and

workshops (9,11). The idea, simply put, is that the opinions of children on content and learning objectives are given due weight in decision making processes. Similar research such as Youth Voice or Pupil's Voice contain many of the same principles (12). Exactly how much say children have in these matters is modelled by Hart's Ladder of Youth Voice. See Figure 1.

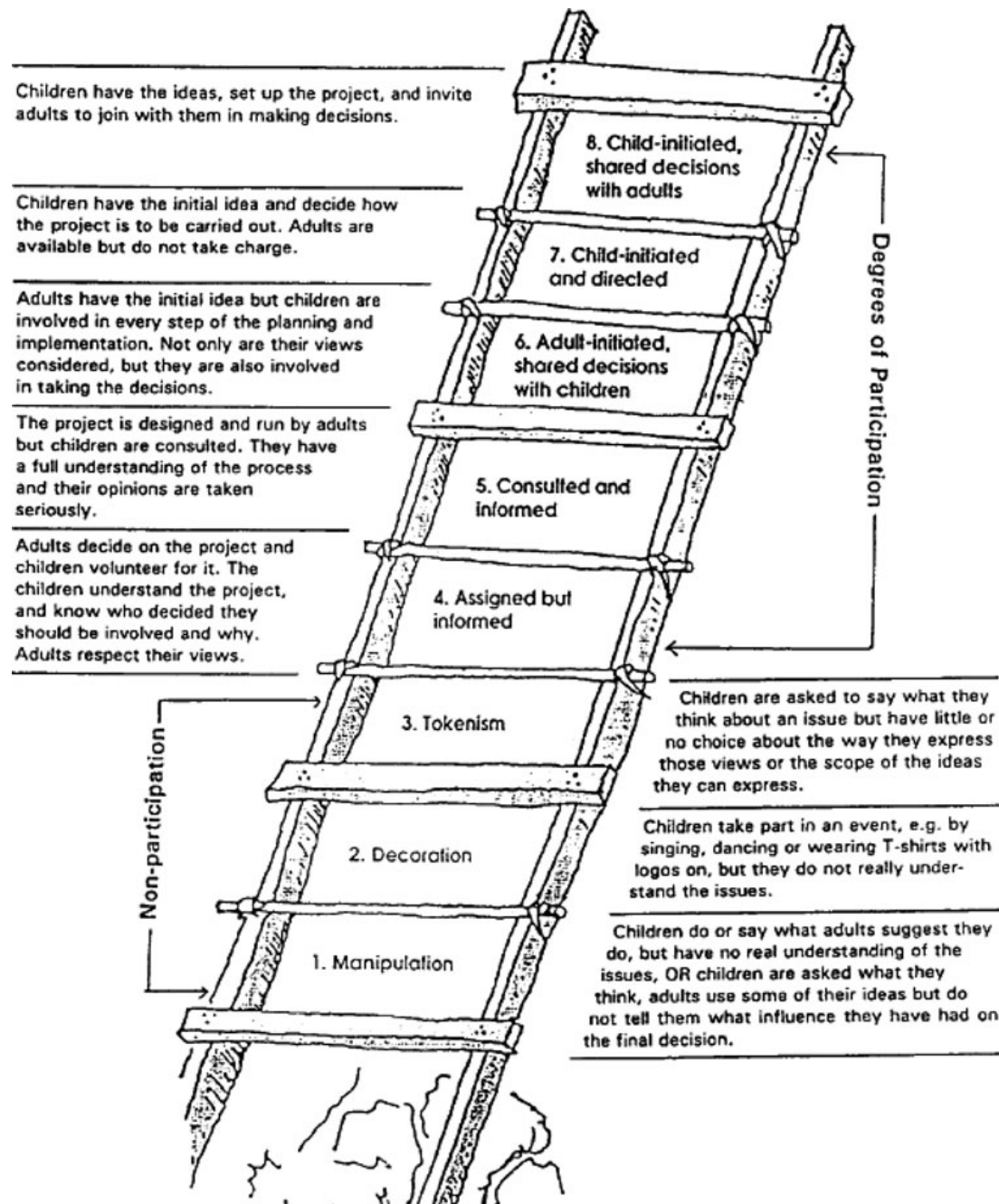


Figure 1: Hart's model of Youth Participation (1992). Here different level can be discerned from the way children are involved in a project. It runs up all the way from children being manipulated to the benefit of adults to children initiating a project where adults can aid them in decision making.

This highly influential model has inspired more recent adaptations such as the organisational model of Shier, distinguishing 15 steps and 5 levels of participation (13). The original model's strength not only lies in describing what child participation entails, but also what it is decidedly *not*. Especially the lower

three levels of Hart's model have been useful for discerning non-participatory productions from actual participatory projects.

It is highly interesting to note that outside of this theoretical framework its principles are, perhaps unwittingly, put into use in many of the child documentaries produced in the Netherlands. In fact, the level of equality filmmakers provide to their subjects has become famously known as 'The Dutch Touch'(14). In part, this is a visual style, letting images explain themselves rather than clarify it with text or talk. Notably, there are also no adult narrators, instead voice overs consist solely of interviews with the children. The director is also never seen and adults are rarely in the centre of attention. This is reflecting in such choices such as framing, with adults frequently being cut off due to the low camera standpoints. Even parents are rarely interviewed. In doing so, these documentaries show us the perspective of the child.

Guidelines in participation

When choosing a participatory approach, children are consulted at every step during the development process. It requires relinquishing a great deal of creative control. The return could be a better connection to the things children feel are important about the Universe. This in turn may provide a better educational experience for children viewing this content.

In general, level 5 of Hart's Ladder can be reasonably achieved by activities such as visiting schools and engaging in brainstorm sessions with children. In addition it allows staff to retain a level of creative control to ensure good production value. Children can be consulted in such a session after first being introduced to the topic by one of the UNAWE activities (15). Time permitting, child participation level can also reach level 6 of Hart's where they are given equal say in considerations such as content, style, and locations. A higher level is unattainable due to the adult initiated nature of the research. The importance of this level is that within the restraints of the project as outlined by Simon, children get an equal say on decision-making such as filmmaking techniques, presentation, who handles the camera etc. etc. (11).

Successful co-creation projects rely on two principles according to Simon (11):

- Staff members and participants respect each other's goals and interests in pursuing the project. They should create a set of shared guidelines for what is and isn't acceptable and expected over the duration of the project.
- Staff members should not harbour pre-conceived ideas about the outcome of the project. They should be willing to let the project go in the direction that is of greatest value to participants, within the scope of the project guidelines.

Taking this into account children should be given the opportunity to decide on the topic, venue or location of shooting as well creative style.

Research Question

The central question in this research is:

What is the effectiveness of child participation in the production of educational content for children?

This question can be broken down into multiple sub questions:

1. How effective is participation based content in comparison to alternate methods of producing content?
2. How cost-effective and efficient are participation based film projects?
3. What do participants experience and learn from participation projects?

Due to the scope of project, its ambition levels and the limited time available, only the latter two questions will be investigated in this report.

Methods & Materials

Ultimately the most viable and optimal approach was to engage a smaller group of children, between five and seven children in a series of focus groups. The reduced group size and logistics make it easier to engage in a higher level of participation. This also makes it feasible to meet with the children multiple times as opposed to once with larger groups.

Having established the project outlines children were sought to participate in the project. Several schools were approached for seeking collaboration, starting with the school headmasters. In addition, teachers who previously followed activities or seminars of UNAWE were contacted through mail. Furthermore a message was sent to the participants of Jeugd Universiteit, a programme by Museum Boerhaave (16). All messages included the flyer found in Appendix C.

Discussion Sessions

Over the course of five weeks children would discuss with the director and assistant director (AD) on the following aspects: camera operations, film crew positions, storyboarding, story, sound and music, locations, activities, cast and characters.

To ensure a stimulating and sheltered environment for open discussion, effort was put into setting up collaborations with other science communication organisations to find suitable venues for discussions. Each session lasted 01:30h, with a 15 minute break during which refreshments were offered. Various brainstorming games were used for a film production breakdown schematic and storyboarding exercise (17,18).

The first session was devoted to introducing astronomy with a presentation led by an UNAWE astronomer and letting the children familiarise with the staff and other children. Consequently the following sessions focused on the nature of film and video as a medium, the filmmaking process and creating a working script.

The resulting discussions and storyboards were incorporated into a script by the director, who also made all the necessary arrangements for the actual film shoot.

Informed consent

Though initial responses come through mails by the parents of the children, there is still a need for children to be able to make an informed consent. Children were allowed to familiarise themselves with the concept of video recording and their appearance on screen during the first introduction session. Only then did the children and parents/guardians sign a Creative Commons 3.0 BY-SA (Unported) release form. This form can be found in Appendix D. The method used for this research has been described by Robson who provided children with camcorders prior to seeking informed consent (19). Armed with newfound knowledge on the consequences of appearances in videos, children are then capable of making an informed decision.

Evaluation

The children were evaluated at the start of session three and five. The UNAWE questionnaire and Personal Meaning Map (PMM) were used for evaluation at session three (20). A customised questionnaire specific to scientific filmmaking was used at session five. Further evaluation made use of a picture based game to identify several objects in the universe (20).

Engaging children

Children respond best to instructions when consistently given by a small number of individuals. Too many people and they may find themselves conflicted for both attention and authority. Most logically

the Director would assume such duties. However, given the pressure of handling technical production that could prevent appropriate attention to kids, the choice was made to have an Assistant Director. In this way the production could approach the concept of 'One Voice to the Child' (21).

Production

Various venues were explored for filming until a location was found that satisfied all the criteria of the script. Care was taken that production was covered by adequate insurance (BEWAVE company) and fire safety equipment.

Crew consisted of the following roles: Director/Producer, Assistant Director, Director of Photography, Camera Operator, Sound Mixer, Boom Operator, Gaffer, Grip and Educational support. Further support was provided by Craft services. The film was shot on two Canon C100 cinema cameras, on internal codecs.

The seven children featured as lead talent in the film with an amateur astronomer co-starring, completing the cast at 8 people.

Call sheets with contact details were sent to the crew in addition to a briefing to ensure smooth operation on set. A local pizzeria provided dinner.

Post Production

Upon the end of production, first cut was created and children were invited for additional voice over work and re-recording in case this was required. Further consultation took place on the title of the film, though final choice was reserved to the UNAWE team, due to marketing concerns. Finally a premiere was organised for all people involved at the local science and arts film festival Nacht van Kunst en Kennis (22).

Budgeting

From the start of the project three different prospective budgets were created, tailored to different scales of production. The three options were €3000,-; €5000,-; €10000,-. A traditional spreadsheet was used from *Film + Video Budgets* modified to show relative expenditures (23). The budget top sheet is printed below, the full budget can be found in Appendix B.

Note that film production differ from most budgets because there are often many posts that depend on the total budget size, such as insurance premiums and contingency funds. Contingency, usually at 10% of the total budget, is meant to prevent cost overshoots by setting funds aside for unforeseen circumstances. This is helpful if, for example, issues arise during Post-Production.

Budget Top Sheet

Fringe assumptions:

Payroll Tax	21%
WGA	0%
DGA	0%
SAG	0%
AFTRA	0%
Agency Fees	0%

DOCUMENTARY FILM

Shoot Days:	1
Location:	Ruighoek
Unions:	None
Production:	H.264
Off/On-Line:	Nonlinear
Finish:	H.264

SUMMARY BUDGET

02-00 Script	0	0%
03-00 Producers Unit	0	0%
04-00 Direction	0	0%
05-00 Cast	0	0%
TOTAL ABOVE-THE-LINE	0	0%
10-00 Production Staff	0	0%
13-00 Production Design	0	0%
15-00 Set Operations	0	0%
17-00 Set Dressing	0	0%
18-00 Property	0	0%
19-00 Wardrobe	0	0%
20-00 Make-Up and Hairdressing	0	0%
21-00 Electrical	233	4%
22-00 Camera	1.150	20%
23-00 Sound	700	12%
24-00 Transportation	63	1%
25-00 Location Expenses	395	7%
26-00 Picture Vehicle/Animals	0	0%
27-00 Colour Correction	598	10%
TOTAL PRODUCTION	3.139	55%
30-00 Editorial	50	1%
33-00 Music	450	8%
34-00 Post Production Sound	350	6%
35-00 Titles & Graphics	600	11%
TOTAL POST-PRODUCTION	1.450	25%
37-00 Insurance	250	4%
38-00 General & Administrative	0	0%
39-00 Marketing	285	5%
TOTAL OTHER	535	9%
Total Above-The-Line	0	
Total Below-The-Line	5.124	
Total Above and Below-the-Line	5.124	
Contingency @ 10 %	569	10%

GRAND
TOTAL

€ 100
5.694 %

Results

Contacting schools had limited success, most school were either focussed on a mandatory test called CITO at the end of Dutch primary education, or were already swamped with activities from other educational organisations. Especially schools from disadvantaged neighbourhoods showed little interest. More success was had with the *Jeugd Universiteit* mailing list and teachers who had previous experience with UNAWE, each yielding four responses.

Eight responses in total were received and seven children were selected for participation. Many of the children had a heightened interest in astronomy with several of the children writing personal messages, sent from their parents email account. Two of the older individuals had personal email accounts.

Two organisations were found willing to collaborate on the project: Museum Boerhaave and UTOPA academy, a Leiden based organisation which trains children in doing research. In doing so the discussion sessions 1, 2, 5 and 3, 4 could be held at the Kinderrechtenhuis and Museum Boerhaave respectively. Both locations were chosen to help inspire and motivate the children through their grandeur and child-friendliness. Children were happy with the venues which allowed for a visit to the museum during breaks and the open courtyard provided by the Kinderrechtenhuis. A temporary exhibition on the life of Christiaan Huygens conveniently addressed the topic of telescopes and life on other planets.

Sessions

Session one

Children were introduced to the ideas of astronomy by a 15 minute presentation given by an UNAWE astronomer. This talk consisted of a brief overview of many of the items in the universe. Guiding narrative throughout the presentation was a sense of scale as the presentation covered increasingly large objects in the universe, starting with our solar system. The talk was concluded by a computer generated movie zooming in and out of the sun's place in the universe. After initial introductions the question was posed what they would like to talk about and create drawings based on this. The most exciting subjects were found to be aliens and black holes, with most stories occurring in space.

Keeping in terms with the project principle of not having a preconceived notion of the outcome, staff rather took a moderating role. This meant repeatedly returning to the question: How would you film this? Several ideas had to be rejected, such as green screen studio work, because of its prohibitive costs and post-production efforts. During breaks in the sessions children either recreated outside in the courtyard or attended an exhibition at the museum.

Session two

For the second session, two main games were undertaken, the first was a categorisation game where 'Film' was the main branching point (17). A subdivide in Picture and Sound was suggested, a third 'Behind the scenes' category was added. Children were asked to write down all they could think of related to film, on sticky notes provided to them. This led to a large variety of suggestions with such concepts as 'Actor', 'Director', and 'Camera' being amongst the most common. After the initial note making session the post-it's were categorised with lines drawn between them to represent the connections between them. Creating categories created conflicts between different concepts, e.g., did the camera belong to

the picture or behind the scenes category? This showed to the children the interconnectedness of many factors in filmmaking.

The second game was again based on sticky notes, however this time the intent was to decide on topic and activities. The participants were asked to write down what topics they would like to do most. Sporadic discussions between the students took place when they wanted to share ideas. All notes were collected on a flip board where the most popular topics were circled. The discussion of the topics on the board culminated in a brainstorm session where the potential of the various topics was discussed. In the end, they strongly wanted to interview an astronomer as well as looking at stars or planets in a stargazing session

Session three

The main goal of the third session was to synthesise a storyline as well as preliminary storyboard. To start things of the kids were evaluated on their knowledge by means of an personal meaning map, i.e., a drawing of the night sky as well as a questionnaire, all according to the UNAWE evaluation guide.

Next, the children were given pen and paper to come up with questions they had thought about last week. They were collected and partially put into an appropriate order. Some children had previous experience with either being interviewed or taking interviews. In addition some were capable of making the distinction between personal questions and substance questions.

The question of storyline was brought up by asking what should be done with the stargazing session. What resulted was a story involving travel through the universe, starting from earth, moving further and further away to see larger and larger entities in the Universe. Children would be dropped off on different types of objects only to be picked up on the return journey back to Earth.

The story created from this initial idea would consist of a camping scene where the children would engage in stargazing with a portable telescope, interviewing an astronomer, possibly with a campfire, and then take off in a rocket to explore the Universe. This would take them from planets all the way through the Milky Way and back until they land on Earth again.

Session four

The Fourth session was devoted to storyboarding. The story was divided in three parts and pairs of children worked on the separate sections. Putting together the three parts a story could be formed so that there was agreement on the storyline. An outstanding issue was the need for a rocket in the story. This would be very difficult to introduce realistically, a more importantly, believably in the movie. After discussions a solution was found to experience the journey through space in the form of a dream instead. The twist would be that though they were dreaming, their journey did in fact happen.

Session five

During the fifth session the ideas of the children for their personal journey through space was discussed. There were also several roles and dialogs to be distributed among the children. For the most part the children who came up with a certain idea for a scene were also given the corresponding part. One child could not come up with a thing to do in space and was given the role of observer in the film.

Evaluation

Personal Meaning Maps (PMM) showed an empty night sky with the instructions to fill the sky in with objects they know. All children drew stars, five children drew the moon. One child drew two constellations. At the same time a slightly modified UNAWE activity questionnaire was taken with the most relevant results summarized here. All children responded wanted to know more about astronomy. All children responded no to the questions if there was anything they did not like. Five

children had questions about astronomy at that time. Six children had ideas for a hypothetical space museum. One child reported he did not like moving between locations.

Another questionnaire was given to the children at the final session. Questions and results listed below.

1. What is the difference between film and reality?
2. What do you think children should know about the Universe?
3. Why should children learn things about the Universe?
4. How does the night sky look in South Africa or somewhere else on the southern hemisphere (for example Australia)?
5. Do people in Australia see the moon differently than people here in the Netherlands?
6. Suppose you are an astronomer and you want to find life on other planets. How would you do this?

Four children could correctly identify the distinction between the fiction of film and reality [1]. One remarked that characters know what is going to happen in film. Responses on question [2] varied from planets and stars, to the order of planets, to 'a lot' and 'everything'. Two children noted that children should only learn about the universe if they wanted to. Two children misinterpreted the question. Some children replied to Question [3] with: 'If you want to become an astronomer; In case something happens to the solar system; Because then you study it and get a fun job; Because it is fun.; You are a part of it; You don't have to, but it's useful; Only if they want to.' Questions [4] through [6] were meant to provide an indication of the awareness in relation to the Universe. Five children answered that the looked different in response to question [4], with one saying that the centre of the Milky Way can be seen from the southern hemisphere. Question [5] yielded an array of answers. Two children simply wrote 'yes' and only one child correctly identified that the moons image would appear upside down. Question [6] was distinctly open ended which gave a variety of plans. This included: 'Invent something that can travel at the speed of light; Study it with robots; Siting in a spaceship; Measure water, food and oxygen en how it is from a star; Put a camera there.' One child misinterpreted the questions and instead answered how one would bring life to a planet.

A final evaluation game was played with three out of seven children. It consisted of grouping various objects together based on their properties. Exercise one through four were completed without errors. The children however failed to distinguish between open and globular star clusters. The difference between star nebulae and star clusters was also not understood. In exercise six the children wrongfully included nebulae where galaxies and galaxy clusters were required.

The children had a good grasp of the objects in the solar system, but had more trouble with complex and more remote objects such as galaxy clusters and nebulae.

Synopsis

Children on an astronomy camping trip, tell stories around a campfire. Upon nightfall they gaze at the stars in a clearing of the woods together with an astronomer. The telescope brings stars closer, but that's not close enough. They would rather be among the stars. They make a wish to fly through space after they spot a falling star. One boy though, does not believe in wishes. The children go to sleep but the one boy wakes up and returns to the telescope. He falls on his back in amazement because up in the sky, he can suddenly see the dreams of the children. They are dreaming of being in space! The next morning the boy listens to the children talk. When they tell about their adventure in space he tells them what they experienced really happened. They decide to keep it a secret because no one will believe them.

Budget

After determining the needs and possibilities of the project the budget was settled on €5500,-. Careful budgeting was critical to the success of the project and optimizing its effectiveness. Through continuous and meticulous updating of the budget, changes in such matters as total production days and moving to multi camera operation could be accommodated without risking to overshoot on budget. Total projected expenditure as of writing is €5.124,-. The film has a Total Run Time (TRT) of 00:11:15 leading to a cost per minute of €460, excluding permanent staff wages. The breakneck speed of technological advance in digital cinema is going up the possibility of filmmaking to more and more organisations.

Production

Because a film shoot can be a very exerting undertaking for all involved, and because of the logistical complexity associated with multi-day shoots, the film was shot on a single day instead. It was judged that the children would lose concentration if they had to act multiple days.

The script called for a location in wild nature with the possibility to camp and most importantly light an open fire. After contacting several nature organisations it proved to be impossible to find such a location that met all the requirements in a nature reserve. Instead campsite *Ruighoek* was found willing to facilitate shooting. The campsite was located at the border of the *Amsterdam Waterleidingduinen* nature reserve.

Rental equipment was picked up at 12:00h for preparation and equipment checks. First crew gathered at 16:00h, cast at 17:00u with shooting commencing at 19:00h. The film shoot was wrapped at 01:30h leading to a total shooting time of 06:30h. No calamities occurred during shooting. All required material and coverage was taken during principle photography, therefore no pickups were needed.

Post Production

After the shoot all footage was collected, reviewed in Adobe Prelude edited into a first rough cut on Adobe Premiere Pro. Further editing followed after checking for scientific accuracy and story flow, resulting into two more cuts. A dream sequence in the film required extensive SFX work that was carried out in Adobe After Effects. Voice overs were recorded in with a portable vocal recording setup using Adobe Audition. The final cut was sent to the audio editor for composing, Foley and dialog editing. A graphics artist was hired to create opening and closing credits. The film was then graded by an experienced colourist in the presence of the director, using Blackmagic Davinci Resolve at the *Gooi en Vecht studio*, located at the *Wisseloord Studios* in Hilversum.

Voice Overs

Voice over had to be recorded for the children's journey into space. To this end children were invited to the observatory where a particularly quiet room was used for the recordings. Together with the children the director came up with an idea what they would experience or encounter in space. Only segments of the recordings were used in the final recordings, because of the need for brevity and story flow.

Discussion

The choice of venue was beneficial to the project although time and resources, setting up equipment, beverages and snacks in various venues proved to be time-consuming indeed. Holding sessions in-house could provide savings in this regard, although this does raise concern over the influence of less child-friendly environments.

Observations during sessions

Given the extraordinary imagination of children and tendency to focus on difficult subjects, the main challenge was to guide their exuberant enthusiasm into a more coherent and practical direction. The age differential can clearly be felt with the participants. Older children had a longer attention span and better understanding of filmmaking processes. Interestingly, it never occurred to the children to take on role or type that was not their own, i.e., acting. Though they would say scripted lines, their own names were used in the film.

Children were often found to have no preconceived notions on various subjects. If they were asked about their opinion on such topics they were largely reliant on the information provided to them by staff. This leads to the situation where the output of discussions depends on the input of information. The value of the interaction then lies in the way children deal with the information presented. It is important to keep this in mind and to not expect completely *ab initio* ideas.

Additionally, there is a strong flexibility in the thoughts and ideas of the children. For example when the third session started off with gathering questions for an interview with an astronomer, this had been largely forgotten when a new idea for an adventurous story line appeared.

Evaluation

From the results of the first questionnaire it becomes apparent that the children had little experience with filmmaking and to a lesser extent astronomy. Questions relating to project experience were rated positively. The level of prior knowledge is something that can be taken into account when designing a project. It determines the amount of education that is necessary during this projects. The knowledge levels found would indicate that it could be a good strategy to recruit children who previously were exposed to an astronomy course or related activity. This way the most time can be spent on crafting a story. Children however did learn new things during the project and their newfound knowledge is exhibited throughout the film. Children often had a particular topic that attracted their interest and were encouraged to study this as homework for the film.

Role of crew

The choice of using a professional crew for the film has been beneficial to the overall production quality of the film. This not only an overall pleasing experience of visuals and sound, but also provided time for the director to focus on directing the children in their acting which improved their play in the film. Furthermore the use of a professional crew allowed for a tight shooting schedule of one day, matching the attention span of the children.

Children as cast

The children starring in their own story had several benefits. First they negated the need for hiring (expensive) child actors. Secondly because they were intimately aware of the plot, the need for script-reading sessions with actors was eliminated. Lastly, by letting the children act as themselves they were able to punch above their weight in respect to authenticity and acting performance.

Narrative fiction for science

Narrative filmmaking limits knowledge transfer in some ways. In a fictional story it is not believable if characters continuously state facts or point out scientific phenomena if there is no probable reason for it. Explaining things like this without an appreciable motivation is called exposition in filmmaking and is thought to be a sign of poor plot or storytelling. Thus for maximising knowledge transfer non-fiction approach such as documentaries hosted by scientist might be more efficient. However such approaches lose out to narrative film in their ability to captivate audiences.

These limitations however do not exclude the possibility of transferring knowledge, instead such moments need to be carefully crafted and embedded into an emotionally rewarding story. Such stories can inspire the audience, for example by cultivating some children's desires to become scientists. According to Olson, greatest potential of film for science is its ability to inspire (24). It is tempting to speculate that such inspiration is ultimately more influential for children's career choices than scientific facts alone.

The combination of the role of producer and director proved to be strenuous at times, mostly due the necessarily tight time planning. A choice was made to focus most attention on producing, i.e., planning the shoot and things as communication to the parents, insurance etc. Storyboarding and scripting suffered from this. Separating the roles can provide benefits to the production or alternately allowing for more time reduce the strain.

Recommendations for future projects

Though in principle all aspects of the project should be decided equally by children and adults, it was found that certain areas, such as choices in cinematography could not be shared with the children, due the lack of background knowledge of the children. Making decisions requires information on what is being decided on and due to time constraints it proved impossible to provide the needed information in all facets of the filmmaking process.

The combination of the role of producer and director proved to be strenuous at times, mostly due the necessarily tight time planning. A choice was made to focus most attention on producing, i.e., planning the shoot and things as communication to the parents, insurance etc. Storyboarding and scripting suffered from this. Separating the roles can provide benefits to the production or alternately allowing for more time reduce the strain.

Regardless of the scientific value of this experiment, the amount of people reached with the film is important from an organisational standpoint. Marketing therefore represents an important challenge for projects like this. Ideally an integral marketing strategy includes continuous updates on the progress, so as to build an audience before the release of the film. Such an integrated approach was not possible here due to the limited time and the choice for high production value and storyline. However can still be effectively promoted through online networks and by asking all involved people to help promote the film through social media.

Relocating the discussion sessions to UNAWE's office could reduce logistical effort, freeing up time for the actual discussion preparations.

Addition of a Stills Photographer to the production crew would provide tangible benefit to the marketing effort through high resolution still photographs.

Conclusion

Child participation is a time consuming endeavour, but the results are ultimately rewarding for both the organisation involved and the participants of the projected. The project has been positively received by the participants and their parents/guardians. As to be expected from a first foray into film production for UNAWE, a lot of time was spent on investigating literature, best practices with children and production workflow. With experience the additional effort required for participation can be reduced in comparison to more traditional writing models.

Working with children as both writers and actors has proven to be a successful way of creating content, eliminating the need to hire child actors. Furthermore the authenticity and unique insights in children's interest offers the opportunity to created tailored content for child audiences, while nonetheless maintaining appreciably high levels of production quality.

Film is an expensive medium to produce, but for educational organisations and non-profit projects a lot of costs such as permits and location rental costs are either reduced or waived. Equipment rental makes a high production quality possible without a high up-front cost. In addition the breakneck speed of technological advances in digital cinema, creating ever more affordable equipment, is going to open up new possibilities for many organisations.

Child participation presented in its current form as a collaboration between a professional production team and enthusiastic children provides great opportunities for educational content that could captivate the attention of its intended audience. Furthermore, cinema has great inspirational power in addition to its educational potential, which warrants further investigation. Though relative effectiveness can be hard to judge from a single project that serves as a proof of principle, it can be concluded that using child participation in the production of educational film projects can be an effective tool for the creation of children's media.

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Appendix A – Session Reports

Report first discussion session Wednesday 22 May

Present: 6 Children (David, Jottum, Jochem, Lotje, Julie Lukas)

Children were introduced to the ideas of astronomy by a 15 minute presentation given by a UNAWE astronomer. This talk consisted of a brief overview many of the items in the universe. Guiding narrative throughout the presentation was a sense of scale as the presentation covered increasingly large objects in the universe, starting with our solar system. The talk was concluded by a computer generated movie zooming in and out of the sun's place in the universe.

After this the concept of film was demonstrated to the children by briefly capturing their imagery on video. The video of themselves and their fellow children was then played back to them, so that they could clearly see how they appeared on video.

One child had previous experience with self-made movies, noting that it was about 'nothing'. Two other children had experience with being recorded by family members. Another still, mentioned that one's voice sounds different when played back from a recorded audio or video segment.

After discussing the notion of audio visual recording and explaining the possible project platforms of distribution, including film festivals, radio internet and television. Release forms were signed together by children and their parents.

Finally the children were allowed to take a break and entertain themselves with a ball game. At this point parents left and subsequently the children were taken to a smaller room.

Children were introduced to each other and staff of Director and Assistant Director with a round the table introduction round. Name stickers were made for all children and staff. The remainder of the time was spent making free form drawings of a story in their head. Most popular topics were black holes and aliens.

Given the extraordinary imagination of children and tendency to focus on difficult subjects, it seems that our main challenge would be to guide this into a more coherent and practical direction.

Next session should be devoted to deciding on a topic and perhaps start with role playing games.

Report second discussion session Wednesday 29 May

Present: 7 Children (David, Jottum, Jochem, Lotje, Julie Lukas, Anouk)

We had one new participant, Anouk, who was quick to introduce herself.

Two main games were undertaken, the first was a categorisation game where 'Film' was the main branching point. A subdivide in Picture and Sound was suggest, a third 'Behind the scenes' category was added. Children were asked to write down all they could think of related to film, on sticky notes provided to them. This led to a large variety of suggestions with such concepts as 'Actor', 'Director', and 'Camera' being amongst the most common. After the initial note making session the post it's were categorised with lines drawn between them to represent the connections between them. Creating categories created conflicts between different concepts, i.e., what belongs to what. This showed to the children the interconnectedness of many factors in filmmaking.

The second game was again based on sticky notes, however this time the intent was to decide on topic and activities. The participants were asked to write down what topics they would like to do most. Sporadic discussions between the students took place when they wanted to share ideas. All notes were collected on a flip board where the most popular topics were circled. The discussion of the topics on the board culminated in a brainstorm session where the potential of the various topics was discussed. In the end, they strongly wanted to interview an astronomer as well as looking at stars or planets in a stargazing session

Ending the session, homework was given to decide on the questions they would like to such an astronomer.

The age differential can clearly be felt with the participants. Older children had a longer attention span and better understanding of filmmaking processes.

Report third discussion session Wednesday 05 June

Present: 7 Children (David, Jottum, Jochem, Lotje, Julie Lukas, Anouk)

The third session took place in another venue, namely museum Boerhaave. The teaching room was graciously provided by the museum staff. The museum was of interest because of several astronomical objects on display throughout the permanent exhibits.

The main goal of this session was to synthesise a storyline as well as preliminary storyboard. To start things of the kids were evaluated on their knowledge by means of an personal meaning map, i.e., a drawing of the night sky as well as a questionnaire, all according to the UNAWE evaluation guide.

Next, the children were given pen and paper to come up with questions they had thought about last week. They were collected and partially put into an appropriate order. Some children had previous experience with either being interviewed or taking interviews. In addition some were capable of making the distinction between personal questions and substance questions.

The question of storyline was brought up by asking what should be done with the stargazing session. What resulted was a story involving travel through the universe, starting from earth, moving further and further away to see larger and larger entities in the Universe. Children would be dropped off on different types of objects only to be picked up on the return journey back to Earth.

The story created from this initial idea would consist of a camping scene where the children would engage in stargazing with a portable telescope, interviewing an astronomer, possibly with a campfire, and then take off in a rocket to explore the Universe. This would take then from planets all the way though the Milky Way and back until the land on Earth again.

Of course such a sequence of events is quite an undertaking to visualise and thus given the participatory nature of the discourse, the participants were asked how they would see this visualised. The next session is devoted to finalising the story and working on individual scenes.

There is a strong flexibility in the thoughts and ideas of the children. For example when the session first started off with gathering questions for an interview with an astronomer, this had been largely forgotten when a new idea for an adventurous story line appeared.

Appendix B – Budget

**DOCUMENTARY
FILM****Fringe assumptions:**

Payroll Tax 0%
 0%

DGA 0%
SAG 0%
AFTRA 0%
Agency Fees 0%

**DOCUMENTARY
FILM**

Shoot Days: 1
Location: Ruighoek
Unions
: None
Production: H.264
Off/On-Line: Nonlinear
Finish: H.264

**SUMMARY
BUDGET**

02-00 Script	0	0%
03-00 Producers Unit	0	0%
04-00 Direction	0	0%
05-00 Cast	0	0%
TOTAL ABOVE-THE-LINE	0	0%
10-00 Production Staff	0	0%
13-00 Production Design	0	0%
15-00 Set Operations	0	0%
17-00 Set Dressing	0	0%
18-00 Property	0	0%
19-00 Wardrobe	0	0%
20-00 Make-Up and Hairdressing	0	0%
21-00 Electrical	233	4%
22-00 Camera	1.150	20%
23-00 Sound	700	12%
24-00 Transportation	63	1%
25-00 Location Expenses	395	7%
26-00 Picture Vehicle/Animals	0	0%
27-00 Colour Correction	598	10%
TOTAL PRODUCTION	3.139	55%
30-00 Editorial	50	1%
33-00 Music	450	8%
34-00 Post Production Sound	350	6%
35-00 Titles & Graphics	600	11%
TOTAL POST-PRODUCTION	1.450	25%
37-00 Insurance	250	4%

38-00 General & Administrative	0	0%
39-00 Marketing	285	5%
TOTAL OTHER	535	9%
Total Above-The-Line	0	
Total Below-The-Line	5.124	
Total Above and Below-the-Line	5.124	
Contingency @ 10 %	569	10%
GRAND TOTAL	€ 5.694	100 %

ABOVE-THE-LINE

	<i>Amount</i>	<i>Units</i>	<i>x</i>	<i>Rate</i>	<i>Sub-Total</i>	<i>Total</i>	Perc enta ge
02-00 Script							
		Week					
02-01 Writer's Salaries	6	s	1		0		
Total for 02-00						0	0%
03-00 Producers Unit							
03-01 Executive Producer					0	0	
03-02 Producer					0	0	
		Week					
Prep	4	s	1		0		
Shoot	3	Days	1		0		
		Week					
Post	4	s	1		0		
		Week					
03-03 Associate Producer	0	s	0		0	0	
Total for 03-00						0	0%
04-00 Direction							
04-01 Director							
		Week					
Prep	6	s	1		0	0	
		Week					
Rehearsals	0	s	1		0	0	
Shoot	3	Days	1		0	0	
		Week					
Edit	4	s	1		0	0	
Total for 04-00						0	0%
05-00 Cast							
05-01 Lead Actors							
		Week					
Rehearsals	6	s	5		0	0	
Shoot	3	Days	5		0	0	
05-02 Supporting Cast							

Rehearsals	1	Week	3	0	0		
Shoot	3	Days	1	0	0		
05-03 Day Players (Shoot)	2	Days	0	0	0		
Total for 05-00						0	0%

BELOW-THE-LINE

10-00 Production Staff

10-01 Unit Production Manager	0	Week s	0	0	0		
10-02 Assistant Director	0	Week s	0	0	0		
10-04 Production Coordinator	0	Week s	0	0	0		
10-05 Script Supervisor	0	Week s	0	0	0		
10-08 Production Assistants	3	Days	2	0	0		
Total for 10-00						0	0%

13-00 Production Design

13-01 Production Designer				0	0		
Prep	0	Week s	0	0	0		
Shoot	0	Days	0	0	0		
Wrap	0	Days	0	0	0		
Total for 13-00						0	0%

15-00 Set Operations

15-01 First Grip							
Prep	0	Day	1	0	0		
Shoot	3	Days	1	0	0		
Wrap	0	Day	1	0	0		
15-02 Second Grip (Best Boy)				0	0		
Prep	0	Day	1	0	0		
Shoot	0	Days	1	0	0		
Wrap	0	Day	1	0	0		
15-04 Boom/Dolly Grip	0	Days	1	0	0		
15-05 Craft Service				0	0		
Purchases	1	Allow	1	0	0		
15-07 Grip Expendables	0	Allow	1	50	0		
Total for 15-00						0	0%

17-00 Set Dressing

17-01 Set Decorator				0	0		
Prep	0	Week s	1	0	0		

	Shoot	0	Days	1		0	0		
	Wrap	0	Days	1		0	0		
17-05	Expendables	0	Allow	1	100	0	0		
17-07	Rentals	0	Allow	1	50	0	0		
Total for 17-00								0	0%
18-00 Property								0	
18-01	Property Master					0	0		
	Prep	0	Week	1		0	0		
	Shoot	0	Days	1		0	0		
	Wrap	0	Day	1		0	0		
18-03	Purchases	0	Allow	1	50	0	0		
18-04	Rentals	0	Allow	1	50	0	0		
Total for 18-00								0	0%
19-00 Wardrobe									
19-01	Costume Designer					0	0		
			Week						
	Prep	2	s	1		0	0		
	Shoot	3	Days	1		0	0		
	Wrap	2	Days	1		0	0		
19-02	Costumer					0	0		
			Week						
	Prep	2	s	1		0	0		
	Shoot	3	Days	1		0	0		
	Wrap	2	Days	1		0	0		
19-04	Expendables	0	Allow	1	25	0	0		
19-06	Rentals	1	Allow	1	0	0	0		
Total for 19-00								0	0%
20-00 Make-Up and Hairdressing									
20-01	Key Make-Up Artist								
		1	Day	1		0	0		
		3	Days	1		0	0		
20-02	Additional Make-Up Artist					0	0		
		1	Day	1		0	0		
		3	Days	1		0	0		
20-05	Purchases	0	Allow	1	25	0	0		
20-08	Film	1	Allow	1	0	0	0		
Total for 20-00								0	0%
21-00 Electrical									
21-01	Gaffer					0	0		
	Prep	0	Days	0		0	0		
	Shoot	0	Days	1	200	0	0		
	Wrap	0	Day	0		0	0		

21-02 Best Boy				0	0	
Prep	0	Days	0	0	0	
Shoot	0	Days	0	0	0	
Wrap	0	Day	0	0	0	
21-03 Electrics	0	Days	0	0	0	
21-04 Fire Safety	1	Allow	1	33	33	33
21-05 Purchases	0	Allow	1	100	0	0
21-06 Equipment Rentals	1	Allow	1	200	200	200
21-09 Loss & Damage	1	Allow	1	0	0	0
Total for 21-00					233	4%

22-00 Camera22-01 Director of
Photography

		Week				
Prep	0	s	0	0	0	
Shoot	1	Days	1	100	100	100
Wrap						
(Telecine)	0	Days	0	0	0	
22-02 Camera Operator	1	Days	1	350	350	350
22-03 1st Asst. Camera						
Prep	0	Day	1			
Shoot	1	Days	1	200	200	200
22-04 2nd Asst. Camera	3	Days	1	0	0	
22-06 Expendables	0	Allow	1	25	0	0
22-07 Camera Package						
Rentals	1	Days	1	500	500	500
22-08 Storage Drives	0	Allow	1	120	0	0
22-09 Documentary Camera						
Rental	0	Days	1	85	0	0
Total for 22-00					1.150	20%

23-00 Sound

23-01 Mixer

Prep	0	Day	0	0	0	
Shoot	1	Days	1	350	350	350
23-02 Boom Operator	1	Days	1	350	350	350
23-03 Expendables						
(Batteries, etc)	0	Allow	1	25	0	0
23-04 Sound Pckge						
(702T/Mackie/mics)					0	0
Total for 23-00					700	12%

24-00 Transportation

24-03 Equipment Rental

Production Van	0	Day	1	100	0	0
24-04 Gas & Oil	316	km	1	0,20	63	63
Total for 24-00					63	1%

25-00 Location Expenses

25-07 Permits (Student waiver)

25-09 Catering Service

			1		0	0		
Crew Meals (brown bags)	0	Days	8	14	0	0		
25-10 Dinnner	1	Allow	1	148	148	148		
25-11 Craft Services	1	Allow	1	89	89	89		
25-17 Location Site Rental	1	Days	1	104	104	104		
25-18 Documentary Crafts (food & drink)	1	Allow	1	54	54	54		
Total for 25-00							395	7%

26-00 Picture

Vehicles/Animals

26-03 Picture Cars	0	Days	0		0	0		
Total for 26-00							0	0%

27-00 Colour Correction

27-01 Grading

Post	3,3	Hours	1	181	598	598		
Total for 27-00							598	10%

30-00 Editorial

		Week						
30-08 Off/On-Line Editor	4	s	1		0	0		
30-09 Off/On-Line Edit System	4	s	1		0	0		
30-11 Harddrive Cradle	0	Allow	1	40	0	0		
30-12 Harddrive Storage	0	Allow	1	160	0	0		
30-13 Screening Copies	25	DVD	1	2	50	50		
30-14 Video Master/Safety	0	Allow	1	50	0	0		
Total for 30-00							50	1%

33-00 Music

33-01 Composer	1	Allow	1	450	450	450		
(All-In Package includes: Composer, Musicians, Instruments, Synth Studio.					0	0		
					0	0		
Stock	0	Allow	1	50	0	0		
Total for 33-00							450	8%

34-00 Post Production

Sound

34-01 Sound Editor	5	Hours	1	35	175	175		
34-14 Laydown	1	Hour	1		0	0		
34-16 ADR	4	Hours	1		0	0		
34-18 Foley Stage/Editor	5	Hours	1	35	175	175		
34-18 Foley Artists	5	Hours	1		0	0		
34-20 Mix	8	Hours	1		0	0		

34-22 Layback	1	Hour	1		0	0		
34-24								
Stock/Dubs/Transfers (Video)	0	Allow	1	75	0	0		
Total for 34-00							350	6%
35-00 Titles & Graphics								
35-01 Grfx								
Designer/Workstation	24	Hours	1	25	600	600		
35-02 Stocks and Dubs	0	Allow	1	100	0	0		
Total for 35-00							600	11%
37-00 Insurance								
37-01 Producers Entertainment Package					0	0		
Negative					0	0		
Faulty Stock					0	0		
Equipment	1	Allow	1	250	250	250		
Props/Sets					0	0		
Extra Expense					0	0		
3rd Party Property								
Damage					0	0		
Office Contents					0	0		
37-02 General Liability					0	0		
37-03 Hired Auto					0	0		
37-04 Cast Insurance					0	0		
37-05 Workers Compensation					0	0		
37-06 Errors & Omissions					0	0		
Total for 37-00							250	4%
					0			
38-00 General & Administrative Expenses					0			
38-02 Legal					0	0		
38-03 Accounting fees					0	0		
38-05 Telephone/FAX					0	0		
38-06 Copying					0	0		
38-07 Postage & Freight					0	0		
38-08 Office Space Rental					0	0		
38-09 Office Furniture					0	0		
38-10 Office Equipment & Supplies					0	0		
38-15 Parking					0	0		
38-16 Storage (Equip./Supplies/Film/Tape)					0	0		
Total for 38-00							0	0%
39-00 Marketing								
39-01 Filmfestival submissions	5	Allow	1	50	250	250		
39-01 Facebook Ads	0	Allow	1	250	0	0		
39-02 Flyers	1	Allow	1	35	35	35		

Total for 39-00		285	5%
Contingency @ 10%	569	569	10%
GRAND TOTAL		€ 5.694	100%
Total Above-The-Line		0	
Total Below-The-Line		5.124	
Total Above and Below-the-Line		5.124	
<i>Check budget totals</i>		<i>5.694</i>	<i>5.694 100%</i>

Appendix C – Flyer

Rear of flyer shown below.



VOOR WIE?

Ben jij gek op sterren, het heelal en films? Als jij een passie hebt voor sterrenkunde en filmmaken dan zijn we op zoek naar jou. Wat je verder nodig hebt:

- nieuwsgierigheid en enthousiasme
- voor de camera durven acteren
- toestemming van je ouders
- je vindt het oke dat je veel gefilmd wordt
- je bent tussen de 9-12 jaar

WAT GAAN WE DOEN?

We beginnen met een discussiesessie op woensdagmiddag 22-05 van 14:00-16:00 uur in het Kinderrechtenhuis, samen met je ouders. Hierna volgen vier discussiesessies op woensdagmiddagen om 14:00 uur (29-05 t/m 19-06). Ze duren ongeveer anderhalf uur en zijn het Kinderrechtenhuis en Museum Boerhaave.

Hierna gaan we op pad naar een spannende locatie om de echte film te schieten! (2-3 dagen, tussen 22-06 en 30-06)

Aan het einde bekijken we de film samen met de begeleiding en je ouders waarvoor je nog een uitnodiging krijgt.

WAT IS KINDERPARTICIPATIE?

Kinderparticipatie betekent dat kinderen een gelijke stem hebben als volwassenen. Jij mag dus meebeslissen wat we precies gaan doen! Dit project helpt bij een onderzoek naar kinderpaticipatie in films over de wetenschap.

MELD JE AAN!

Om mee te doen, vragen te stellen, of voor meer informatie kun je een email sturen naar schadewijk@strw.leidenuniv.nl

Let op er zijn maar 5 plaatsen!
Zorg ook dat je wel alle dagen kan!

WIE ZIJN WIJ?

EU Universe Awareness (EU-UNAWA) is een internationaal project dat kinderen inspireert met de pracht en grootsheid van ons heelal. Bij ons kan je je horizon verbreden en leer je je omgeving te bekijken vanuit een ander perspectief.

Voor meer informatie over EU-UNAWA, kijk op www.unawe.nl

www.unawe.nl

United Nations Educational, Scientific and Cultural Organisation
International Astronomical Union
Partners for the International Year of Astronomy 2009

Appendix D – Release form

Door ondertekening van deze vrijwaringsverklaring verleen ik (als model) de regisseur, zijn vertegenwoordigers en wettelijke opvolgers, toestemming om de audio-visuele beelden waarop ik afgebeeld voor het UNAWE filmproject (22-05-2013 t/m 2013) te gebruiken als promotiemateriaal en/of te reproduceren in een foto- en/of videoproductie.

Ik ga ermee akkoord dat deze beeldmaterialen en geluiden eventueel worden gecombineerd met andere beelden, teksten en grafieken, worden gecropped, veranderd, of aangepast. Ook stem ik toe dat mijn stem en door mij geproduceerde geluiden kunnen worden veranderd, vervangen dan wel nagesynchroniseerd in andere talen.

Ik ga ermee akkoord dat ik geen recht heb op vergoedingen bij gebruik van deze beelden en dat alle rechten op deze beelden liggen bij de regisseur of opdrachtgever en ik begrijp dat deze verklaring onherroepelijk is. Ik ga ermee akkoord dat de beelden geopenbaard kunnen worden via internet, radio, televisie en drukwerk, Nationaal zowel als Internationaal, onder een Creative Commons 3.0 BY-SA (Unported) licentie.

Naam Model: _____

Adres Model: _____

Telefoonnummer Model: _____

E-mailadres Model: _____

Leeftijd Model (ten tijde van productie) _____

Nationaliteit: _____

Handtekening Model: _____

Nummer geldig legitimatiebewijs (paspoort of rijbewijs): _____

☐ Ik ben tenminste 18 jaar oud en zelfstandig genoeg om deze verklaring te ondertekenen.

☐ Ik ben jonger dan 18 jaar.

Naam Ouder/Voogd Model: _____

Adres Ouder/Voogd Model: _____

Telefoonnummer Ouder/Voogd Model: _____

Handtekening ouder/voogd Model (indien jonger dan 18 jaar) _____

Appendix E – Evaluation Forms