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Instructional Storyboard Outcomes of a Co-creation Workshop for Safety Culture in Digital Fabrication

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Abstract

In this report, we summarize the progress and outcomes from a workshop we held at the 4th FabLearn Europe 2019 conference in Oulu, Finland. The workshop was held at the University of Oulu, Tellus Stage on 28 May 2019. The workshop was motivated by, on one hand, the increased interest in digital fabrication in fab labs, maker spaces, libraries, and schools and, on the other hand, the needs for considering safety issues when using digital fabrication equipment and laboratory spaces open for public and non-professional users. The aims of the workshop were manifold, namely: to increase awareness of safety issues in digital fabrication, to promote the adoption and development of a safety culture in digital fabrication, to discuss and share experiences and information about safety in digital fabrication, and to ideate, design, and prototype the promotion and communication of safety in digital fabrication. For the last aim, a co-creation activity was planned and conducted. Nineteen participants took part in the workshop, representing a wide variety of backgrounds and interests in the topics of digital fabrication, maker culture, digital fabrication education, and safety. Eighteen of the participants have been actively involved in the co-creation of instructional storyboards for presenting the safety rules in fab lab in video format, while 2 facilitators have planned, organized and guided the activities. In total 4 storyboards for instructional videos have been created, each one for a different safety rule chosen by the participants out of 9 pre-defined rules. The progress of the workshop, the storyboards and post-workshop insights are presented in this report. The feedback from participants post-workshop was very positive and the storyboards can be used further in video production.

Keywords: digital fabrication, safety, safety culture, co-creation, participatory approach, workshop, storyboard, participatory media, instructional design

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1. Introduction

At FabLearn Europe 2019 conference held at University of Oulu, Finland during 28-29 May 2019, we have organized and facilitated a workshop on "Co-Creation of Safety Culture in Digital Fabrication". The workshop background is described in [1]. The workshop was intended to anyone interested in digital fabrication, namely students, teachers, practitioners, technologists, designers, academics, etc. Participants in the workshop had diverse cultural backgrounds and professional expertise. Nineteen participants attended the first part of the workshop where the topics were introduced. Eighteen participants contributed to the co-creation activity as part of the workshop's practical exercise. Participants come from different countries: Finland, Denmark, Norway, Germany, Belgium, Brazil, and Portugal. Their occupations varied from teaching to research-oriented such as high-school teachers, university lecturers, junior or senior researchers, doctoral students and professors. Some participants were directly involved with digital fabrication acting in positions such as instructors, fab lab coordinators, technology teachers, project leaders, national facilitators of Fab Lab activities.

The focus of the workshop was on promoting, adopting, and developing a safety culture in digital fabrication [1]. The workshop aimed to increase awareness of safety issues in digital fabrication, to promote safety culture in digital fabrication, to discuss and share experiences and information about safety in digital fabrication, and to ideate, design, and prototype the promotion and communication of safety in digital fabrication. The workshop was planned, organized, and facilitated by two researchers at University of Oulu – Mikko Rajanen and Dorina Rajanen – the authors of this report. The workshop was scheduled to last for 2 h between 12.30 and 14.30 on 28 May 2019. It was a tight schedule with clear activities and tasks that were timed. The workshop was divided in content-related presentations given by the facilitators. The topics of these presentations were: safety culture, safety culture in digital fabrication, safety rules in Fab Lab Oulu[1], participatory video-making, and storyboarding. These presentations alternated with participatory and interactive approaches which requested participants' input; the techniques employed for this purpose included round table discussion, snowball discussion, and collaborative group work. The structure and contents of the workshop are presented in section 2.

The workshop method [2] was employed both as a research method to gather knowledge about safety culture in digital fabrication and as a means to achieve the goal of the co-creation exercise, namely the creation of meaningful storyboards that can be later used in instructional video making of clips illustrating and communicating safety rules in fab lab. The co-creation exercise

[1] Fab Lab Oulu is a digital fabrication laboratory that operates within the University of Oulu. More information here: https://www.oulu.fi/fablab/.

consisted of the following group work activities: ideation, design, and prototype a first version of a storyboard for the instructional video of safety rules. The video with the safety rules was introduced to the participants during the workshop. As mentioned, the co-creation exercise had two aims: 1. to develop a future instructional video of safety rules, and 2. to increase safety awareness through participatory practice.

The workshop was conducted following the guidelines of research ethics. Written informed consent was asked from participants. All participants have given their consent to participate in the workshop for research purposes (see Appendix). Anonymity of participants was agreed upon participation.

The storyboard outcomes of the workshop are documented and published in this report. The pictures and related papers are also available in a GitHub repository (github.com/uxlab-oulu/safety_culture).

The workshop exercise built upon methods and theories of communication and design that are 'human-centered' such as experiential learning [3], social learning [4], co-creation, user-centered and participatory design [5], participatory media [6,7], and framing theory [8] and visual rhetoric [9].

The remaining of the report is structured as follows. Next section describes the structure of the workshop and the main stages and contents. Section 3 describes the results in the form of generated storyboards. Section 4 discusses the workshop outcomes and concludes the paper.

2. Workshop structure

The workshop had the following structure and schedule:

- presentation of workshop facilitators and participants (ca. 10 min),
- introduction to safety in digital fabrication (10 min),
- sharing of experiences of and views on safety issues in digital fabrication (25 min),
- introduction to participatory video making with focus on storyboard co-creation (10 min),
- short break to form the working groups (10 min),
- group work (30 min) including the selection of one safety issue to be presented in a storyboard, and the ideation, design, and prototyping of the storyboard,
- presentation of the storyboard to the workshop participants (10 min),
- feedback, discussion and evaluation (10 min),
- conclusion (5 min).

2.1 Presentation of workshop facilitators and participants

A round table discussion was used at this stage to get to know information about: *Who and where from everyone is, and what background, interests, and concerns everyone has regarding digital fabrication and safety.*

2.2 Introduction to safety in digital fabrication

Safety culture is a concept and practice originating in industry and established as a professional issue since Chernobyl disaster. Safety culture includes guidelines, protocols and procedures, but also an organizational climate and individual compliance. The participation of all employees in creating and adopting safety behavior is required in order to make safety culture effective and functional. High-profile accidents in aviation and space industries highlighted the importance of creating and maintaining safety culture in an organization. In some disciplines (e.g. aviation, space, and nuclear industries) the safety mindset is considered part of the *professional conduct*. One cannot become a professional in these disciplines, and maintain a status as a professional, unless one follows the safety guidelines, procedures, and have safety mindset. Safety is a process of constant improvement, proactive mindset, and responsibility of all.

Digital fabrication is generally safer than traditional fabrication, but there are concerns with toxicity of the materials, fine particles, emitted gasses and noise. These issues may have negative impact on health, safety and environment. Equipment requires adequate training and supervision to be used safely. Instruction manuals, safety guidelines, safety material data sheets, laboratory safety policies should be available and easy to use. Furthermore, the users in fab labs and maker spaces come from a variety of backgrounds and have different user profiles (e.g., children, students, elderly, high-school teachers, instructors, occasional visitors, or experienced digital fabricators, individual users or teams).

It is important and crucial to create written safety guidelines, protocols and procedures, but it is challenging to design them and communicate these effectively to the digital fabricators, given the variety of makers' backgrounds and contexts of use.

Thus, the following challenges exist:

- How to communicate the concept and practice of safety in digital fabrication as professional, social and environmental responsibilities of all fabricators, from the novice (first-timer) to most experienced?
- Digital fabrication is rapid, iterative and hacking-oriented by nature. How safety issues are communicated, how training can be done and how safety culture can be created matching these expectations?

2.3 Sharing the experiences of and views on safety issues in digital fabrication

A snowball discussion was initiated to answer and reflect on the following issues:

- Experiences and views
- Best practices
- Ways to communicate safety
- Ways to build safety culture

This discussion was structured as follows. First, participants were asked to *Identify own experiences of and views on safety issues in digital fabrication*, for example by answering the following questions: *What is the status of safety in digital fabrication? How to improve the safety in digital fabrication?* The duration of this reflection exercise was 3 min.

Second, the participants *Paired up and discussed their experiences and views* for about 5 min.

Third, they *Joined another pair and discussed, identified commonalities and differences, and discussed about possible solutions.* The duration of this joint group discussion exercise was 7 min.

Finally, the last 10 min in this workshop segment were used to open the *Discussion among all participants* on what *Experiences, views, problems, and solutions* are relevant, challenging and envisioned, respectively. This discussion was guided by the workshop facilitators.

2.4 Introduction to participatory video making with focus on storyboard co-creation

Participatory video making was introduced in relation to the concepts of community and democratic participation. People join projects of common interest to bring their contributions to the community. The objective is to co-create a safe and democratic environment with the help of participative group work.

For the workshop, the participants are guided towards *Establishing a shared purpose and collaboration amongst the participants*. Each group is also asked to *choose one or more important issues from the common story based on their own interest.* Methods used are:

- *Round table discussions,* and
- *Snowball discussions.*

The safety issues to be storyboarded were presented as video animation (containing text and pictures, see https://vimeo.com/296006151/0ca1b7be4a) and also printed on A4 paper sheets.

Facilitators help the groups, when needed, to identify and analyze important issues.

Furthermore, the tutorial continues with explaining *What is storyboarding?* Storyboarding helps to develop a strong collective view and story. In a co-creation approach to storyboarding, the group of stakeholders co-creates their vision on the safety issues and transforms it into a storyboard. Furthermore, the groups share their storyboards with each other to create a common vision and storyline. This part in the workshop shapes as a dynamic process of community-led learning, sharing, and exchange. The purpose is not only to storyboard, but to discuss, debate, find meanings, problems, solutions and the common view. The process is as important as, or sometimes even more important than the outcome itself.

The storyboard is meant to plan, design, and pre-visualize a movie, animation or interactive media. It originates from Disney Studios in 1930s. *Gone with the Wind* (1939) was the first completely storyboarded live action movie. The storyboard helps to visualize the storytelling. The focus is on the story and the key events or concepts. One can use sketches and notes on concepts, ideas, dialogue, displayed texts, movement etc.

After the tutorial on storyboarding, a short break of 10 minutes was given, during which participants started to form the working groups.

2.5 Group work

The group work started with the selection of one safety issue by each group to be presented in a storyboard. During the group work there were lively discussions and the participants engaged in the ideation, design, and prototyping of the storyboards. They had to consider the following aspects in the storyboard so that the communication attains its goal: *What is the safety issue about? How to convey the importance of this safety issue?*

Participants were provided with papers, pens and pencils, markers, sticky notes, and flip charts. For the final presentations, they were asked to draw the sketches on the flip charts.

2.6 Presentation of the storyboard to the workshop participants

Four storyboards have been created and presented, one by each group (see section 3). The audience formed by the other participants and the facilitators asked questions and gave comments after each presentation. Each group

presented their story board, described briefly the *Issues encountered, ideas, and solutions*, and answered the questions from the audience.

2.7 Feedback, discussion and evaluation

A general feedback session was facilitated. An informal voting was attempted, but participants agreed that all outputs were interesting, meaningful, and ingenious. The process was considered educational by participants, the storyboards were appreciated as being useful, and each storyboard can be utilized in the creation of a video series or multiple thematic video series. The experience of the workshop was also found useful by both facilitators and participants.

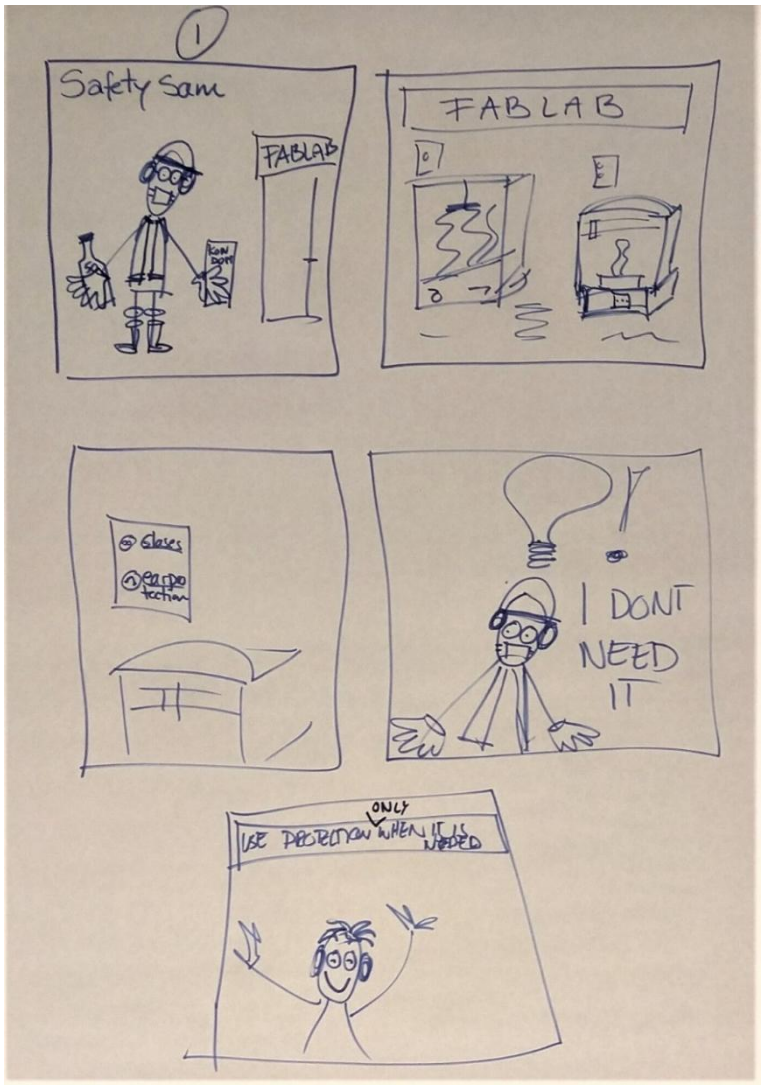
2.8 Conclusion

The workshop was concluded with final remarks and a take home message.

Safety is an important issue in digital fabrication. Safety should be an integral part of all instructions and tutorials about digital fabrication. Students, teachers, practitioners, technologists, designers, academics, fabricators, hackers and all others should know about safety. Creating and maintaining a strong and positive safety culture should be the priority of every fab lab and maker. More research is required on safety and safety culture in digital fabrication.

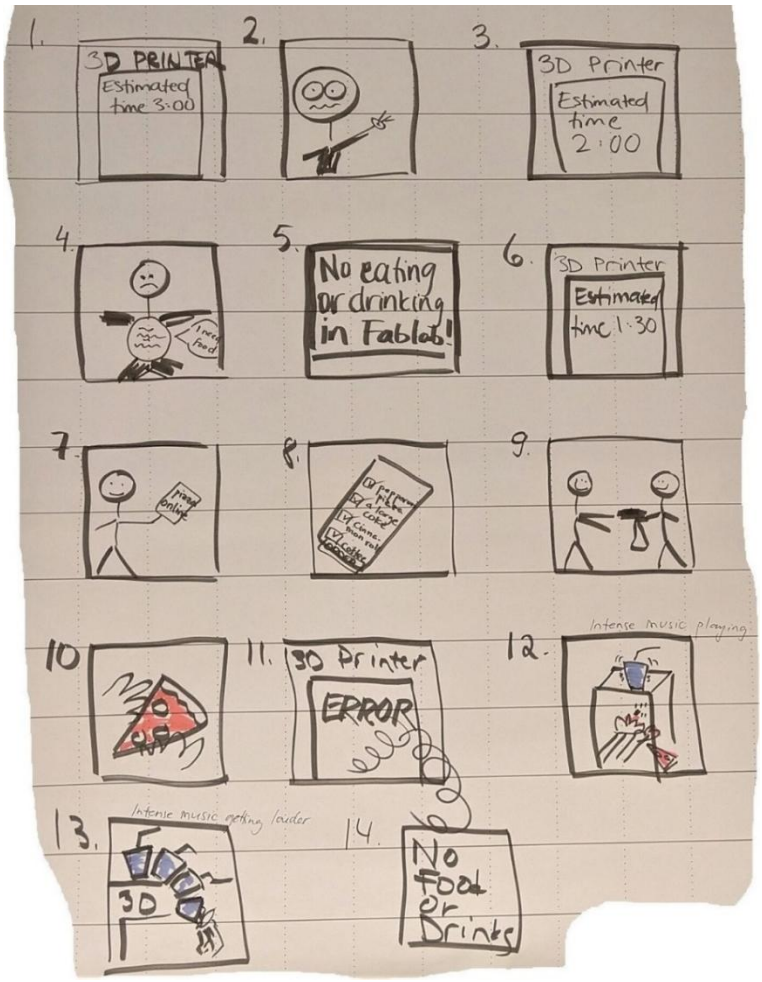
3. Storyboards

In this section the four storyboards generated during the workshop are presented. The presentation includes the graphical sketches and the stories. The written stories were compiled and explained for this report after the workshop based on the oral presentations and the concluding discussions in the workshop.



Storyboard 1: Use protection whenever needed ("Safety Sam")

Group 1 created a storyboard for the rule "Use protection whenever needed". The team came up with the character "Safety Sam" who is very careful and wears all kind of protection (construction helmet, hearing protection, high visibility vest, goggles, etc.). He goes into Fab Lab to fabricate something and he notices that for this machine you only need safety glasses and hearing protection. Safety Sam is happy that he does not have to wear unnecessary equipment, so safety makes sense to him. This story uses reverse psychology and humor. The group suggested that the main character could be depicted as the Fab Lab manager to elicit local relevance.

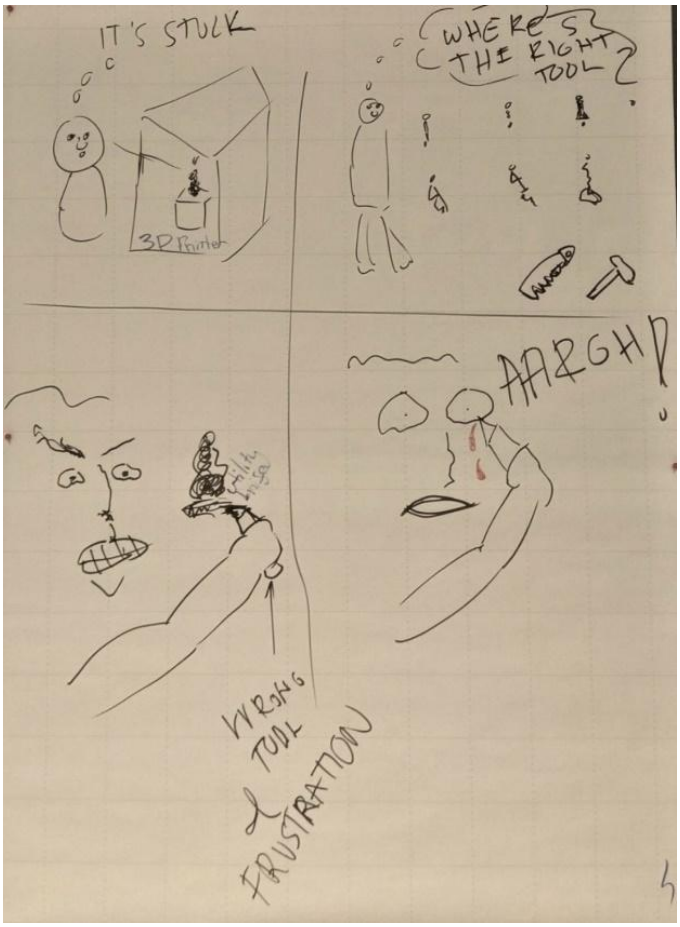


Storyboard 2: Do not eat or drink in Fab Lab

Group 2 created a storyboard for the rule "Do not eat or drink in Fab Lab". The team came up with the situation that a maker is printing a 3D object that will last for 3 hours until completion. The story presents both a situation and a character. The person dutifully waits on the machine and the hours pass slowly, and he starts to get hungry. First, he tries to resist the hunger, but finally the hunger overpowers his sense of duty and he decides to order a pizza and a drink. He gets the pizza and starts eating it. However, the 3D printer develops a malfunction and spews the filament out. The character places the drink on the top of the printer and with his mucky fingers opens the printer to solve the problem. In this commotion, the drink falls in slow motion on the machine while dramatic music starts to play. The movie ends with showing again the rule "No food or drinks in Fab Lab". This story uses humor, drama, and music to elicit emotions. The main message is also shown repeatedly during the video to induce a lasting learning effect.

Storyboard 3: Keep your eyes on the machine ft. Iron Man

Group 3 created a storyboard for the rule "Keep your eyes on the machine". The team centers their story around both a strong character and a slice-of-life situation. The situation is humorous and suits the character. Tony Stark, the main character, aka Iron Man, comes happily to the lab to laser cut a part for his new Iron Man suit. He meets some of his fans in the lab while he is doing the laser cutting. His fans ask for a selfie with him and Tony moves away from the machine to take a selfie with his fan club. When their eyes are not on the machine, the laser cutter catches fire. Tony Stark tries to extinguish the fire, but himself catches fire. In the end, the fabricated part, the laser cutter, and his reputation are all ruined. His fan club is not amused: Tony Stark is not anymore cool. This storyboard uses a famous character, humor, and drama. Everybody should follow the safety rules in the lab. Not following the rules is not cool.



Storyboard 4: After you complete your task in Fab Lab, clean up the mess and leave the space neat and tidy

Group 4 created a storyboard for the rule "After you complete your task in Fab Lab, clean up the mess and leave the space neat and tidy". The team uses a situation to illustrate what happens when people do not follow this rule. The main character has completed a 3D print but is unable to take out his part from the machine because it got stuck. He goes to look for a spatula which is the right tool for this purpose. However, previous makers have not returned their tools where they should be, so he does not find the right tool. He becomes frustrated and tries to remove the part using a utility knife which is not the right tool. He gets hurt. This storyboard uses a similar approach as in public service announcements (aka PSAs). It shows the consequence of not following the rules using an alarming style. Moreover, the person who has not followed the rule of putting the things back at their place is a passive character, not shown in the story, but it has strong influence on the development of the story. The character in the storyboard is also not following a safety mindset as he uses equipment that is not meant to be used for his task. He should have asked Fab Lab staff for help. The message in the story is powerful and shows many sides of not following the rules in the lab: not following the rules has also consequences for other people. Other people can be hurt, and users of the lab perceive that there are no rules, and everything is allowed, which makes the efforts of establishing a safety culture useless.

4. Discussion and conclusion

This report summarized the progress and outcomes of a co-creation workshop, where instructional storyboards were created for digital fabrication safety. In addition, we would like to share some thoughts about the approach and experiences during the workshop. Thus, here we will make some observations and recommendations, especially to other researchers and practitioners wanting to organize similar workshops to contribute to the co-creation of safety culture in digital fabrication.

The initial discussion at the workshop about safety in digital fabrication strengthened our initial assumptions by revealing that there does not seem to be an established safety culture in digital fabrication anywhere in the world and that in many cases the safety procedures and rules are established in name only, not being actually implemented and enforced in practice. Furthermore, the level of adoption of safety culture contrasted the perception of the importance of the safety issues, which has been recognized as being high (see [10] for the summary of the quantitative data collected during the workshop). These observations highlight the importance of systematically mapping the current real status of safety and safety culture in fab labs, maker spaces and other digital fabrication contexts with surveys, interviews, observations and other research methods. It would be paramount to understand the field better and understanding the current situation would help construct and test out different ways to create safety culture and enforce safety rules.

The instructional storyboards proved to be a great tool for co-creation. As the digital fabrication involves people with wide variety of backgrounds, roles and interests, generating storyboards in a participatory co-creation workshop proved to be a very flexible and fast approach towards attaining the defined target. The approach enabled the participants to use their imagination and to negotiate and merge their views on digital fabrication safety and on communicating safety rules. During the workshop, the participants were conducting a shared meaning-making by actively discussing, planning and designing. Creating a storyboard with pen and paper is something that everybody can do, the storyboards are easy to modify, and they can be easily presented and discussed about.

The workshop structure and timing worked very well. However, the organizers of similar workshops should allow some flexibility in their schedule, as for example the initial discussion about safety and own experiences of it may spark unexpectedly long but very fruitful and interesting discussion, which should be allowed a longer time than expected. However, while the organizers should allow some amount of flexibility, they should make sure that the overall length of the workshop is not exceeded, that the breaks can be held as planned, and that one part of schedule being delayed does not jeopardize other important parts of the workshop.

Initially, we intended to have an informal voting at the end of the workshop to select the best storyboard and the most innovative group. However, the groups felt like such procedure would go against the spirit of the co-creation workshop, and therefore the idea of voting and ranking the outcomes of the workshop was abandoned. Organizers of similar participatory workshops should be aware that having such a competitive aspect as part of the workshop could potentially hinder the co-creation aspect of the workshop, where all the deliverables are equally valuable.

In addition to the storyboards themselves, we wrote their ideas and stories after the workshop, based on our discussions with the groups, their presentations, and the general discussions about the storyboards. This proved to be useful, as the storyboards themselves do not carry all the information and insights discussed about in the workshop.

While the participants identified the workshop being very interesting and useful, the increase in safety awareness is difficult to assess. We conducted an initial survey to map the backgrounds and experiences of the workshop participants, but we did not conduct a post-workshop survey to identify if and to what extent this co-creation activity had informed the participants, made them more aware, and what their experiences were like when making the co-creational storyboards and how this workshop concept could be made better. Furthermore, it would had been interesting to gather more insights from the participants about the instructional storyboards, their potential future use, and the role of this kind of workshop in co-creating safety culture in digital fabrication.

A natural step in this work would be to proceed towards the production of the videos using the storyboards generated, and then to evaluate them using different methods. We hope that the workshop and its outcomes as well as our related work on this topic inspire further developments of the research and practice of safety culture in digital fabrication.

Acknowledgements

We thank all participants to the workshop for their contributions.

References

[1] D. Rajanen and M. Rajanen (2019). Co-Creation of Safety Culture in Digital Fabrication. In *Proc. of FabLearn Europe 2019 Conference (FabLearn Europe '19)*. ACM, Oulu, Finland.

[2] R. Ørngreen and K. Levinsen (2017). Workshops as a Research Methodology. *J. of E-learning, 15*(1), 70-81.

[3] K. Hawtrey (2007). Using Experiential Learning Techniques. *The J. of Economic Education, 38*(2), 143-152.

[4] K. Biedenweg and M. Monroe (2013). Teasing Apart the Details: How Social Learning Can Affect Collective Action in the Bolivian Amazon. *Human Ecology, 41*(2), 239-253.

[5] E.B.N. Sanders (2003). From User-Centered to Participatory Design Approaches. In *Design and the social sciences* (18-25). Taylor & Francis, London.

[6] U.S. Harris (2014). Communicating Climate Change in the Pacific Using a Bottom-up Approach. *Pacific Journalism Review: Te Koakoa, 20*(2), 77-95.

[7] H. Rheingold (2008). Using Participatory Media and Public Voice to Encourage Civic Engagement. In *Civic life online: Learning how digital media can engage youth* (Ed. W.L. Bennett) (97-118). The MIT Press, Cambridge, Massachusetts.

[8] R. M. Entman (1993). Framing: Toward Clarification of a Fractured Paradigm. *Journal of Communication, 43*(4), 51-58.

[9] L. Walsh (2015). The Visual Rhetoric of Climate Change. *Wiley Interdisciplinary Reviews: Climate Change, 6*(4), 361-368.

[10] D. Rajanen, & M. Rajanen (2020). Safety Culture in Digital Fabrication: Perceptions, Model and Co-Creation Approach. *Journal of Higher Education Theory and Practice, 20*(14). *In press.*

Appendix. Informed consent form

OULUN YLIOPISTO

Dr. Dorina Rajanen (dorina.rajanen@oulu.fi)

Dr. Mikko Rajanen (mikko.rajanen@oulu.fi)

Consent form for participating in a research study

We, Dorina Rajanen and Mikko Rajanen, are researchers at Oulu University, Faculty of Information Technology and Electrical Engineering, INTERACT Research Unit. In this workshop "Co-creation of a safety culture in digital fabrication" we will use a participatory approach as a research method to gather knowledge about safety culture in digital fabrication and as a means to ideate, design, and prototype of a **storyboard** for further development into an instructional video and for increasing safety awareness through participatory practice. The workshop is conducted following the guidelines of research ethics. Written informed consent is asked from all participants, who may opt out if they do not want their participation to be used for research purposes. While we hope that you will participate in the research data collection, you have the right to withdraw your consent at any time by informing us about your wish.

In this workshop, we will we will collect data as follows:

- participants' background information as described in this form,
- experiences and views on safety issues in digital fabrication,
- storyboard ideation, design, and prototype under different formats such as verbal descriptions, text and graphical depictions.

The data is manually recorded using notes and using this consent form. Photographs will also be taken. The workshop is *not* audio-video recorded. Data produced during both individual and group tasks and discussions is collected. The data produced include different texts, images, as well as transcriptions of oral discussions. Different kinds of data can be joined together in the analysis of the materials. For more information on the data collected, you can contact us at any time.

All data collected will be handled with preserving the anonymity of the participants. The personal information such as name and contact information will be handled according to the GDPR law and the collected DATA WILL BE COMPLETELY ANONYMIZED. Personal data is safely stored by us and not shared with third parties.

The outcome of the workshop will be documented and published as a workshop report in a scientific publication and also be made available online to the participants. Participants are free to use, share, distribute, refine, develop the co-created materials such as drawings and storyboard and derivate new artefacts.

I have read the above description of the workshop and research data collection, and fully participate in the research voluntarily. I hereby give my consent to participate to research data collection in this workshop. I also grant permission for the abovementioned researchers to store and use the data for research purposes.

_____ _____

Place and Date Signature

_____

Name in block letters

Please also let us know the following additional information (optional):

1. Occupation: _____
2. Country of residence: _____
3. What is your role in digital fabrication (teacher, instructor, student, researcher, designer, practitioner, fab lab manager, maker, technologist, hacker, other please specify). If you have more roles, please add them all and circle the main role:

---

4. How important do you think is safety culture in digital fabrication?

Not important at all 0 1 2 3 4 5 6 7 8 9 10 *Very important*

5. What is the level of adoption of safety culture in digital fabrication currently based on your own experience?

It is non-existent 0 1 2 3 4 5 6 7 8 9 10 *Continually improving or mature safety culture*

6. If you wish to be **contacted for a future study,** please add your email address below:

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