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BRINGING MAKER CULTURE INTO MEDIA AND INFORMATION LITERACY.

Case: Global Media and Information Literacy Online Youth Hackathon 2018.

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ABSTRACT

ALEKSANDRA MANGUS: Bringing Maker Culture into Media and Information Literacy. Case: Global Media and Information Literacy Online Youth Hackathon 2018.
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With growing connectivity and descending prices for personal computers and smartphones more and more children and young people are gaining access to online media. This trend comes with a number of risks and has yet inevitable negative influence on how those young media users behave and feel. Therefore, Media and Information Literacy (MIL) has been a recent topic on the agenda of numerous academics, educators and policymakers. The Global Online Media and Information Literacy Youth Hackathon 2018 and the Followup 4-Week Programme (both under the name GlobalMILHack) were the centre case of this study, which emphasised the design methodology in the context of problem-based learning.

The aim of this research study was to undertake a qualitative examination of the GlobalMILHack participants' learning outcomes in order to find out what can hackathon bring from the maker culture to the MIL educational practice. The study adopted action research methodology, since the author was the active part of the whole cycle of the event process from planning to execution to closure and has collected diverse qualitative feedback along the work process and during the interviews, made field notes and observations.

This study has shown that the maker culture can be integrated into MIL educational practice through online hackathon method in different ways: by making the constructive learning happen through problem-focused collaborative adhoc and hands-on approach; by opening up to inter-cultural learning through facilitating the online dialogue; leveraging the critical understanding of media and its role in the society by working on the highlighted social challenges around media use and by creating informed, engaged and empowered porto-publics around the creative solutions.

Keywords: digital citizenship education, hackathons, maker culture, media and information literacy, media literacy.

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CONTENTS

1 INTRODUCTION

With growing connectivity and descending prices for personal computers and smartphones more and more children and young people are gaining access to online media. This trend comes with a number of risks and has yet inevitable negative influence on how those young media users behave and feel (Livingstone et al., 2014). Therefore, Media and Information Literacy (MIL) has been a recent topic on the agenda of numerous academics, educators and policymakers. As any literacy, MIL is considered to be a set of competencies and skills, which, in case of MIL, stand close to the concepts of online and offline media, critical thinking, media use, information and source awareness, digital citizenship and active participation, among others. MIL skills in particular are the ones that are promoted to tackle social challenges such as mis- and disinformation, extremism, cyberbullying and hate speech online, cybercrime of various kinds (sextortion, data theft, violation of human rights etc.). MIL is extremely important today, as it develops critical thinking. A media- and information-literate individual is able to distinguish between reliable sources of information, determine the role of media in culture and be responsible for his/her understanding of the influence of mass communication, while switching between different media platforms.

The search of new educational methods in MIL that are engaging for young audiences is continuously expanding to new areas of pedagogical practice. The attention shift of learners to acquiring MIL competencies, supported by a growing number of players, is occurring in response to rapid digitalisation and growing demand of new skills such as collaborative problem-solving and critical thinking. Research suggests that the end goal for acquiring these competencies is digital citizenship (Jenkins, 2016; Frau-Meigs, 2011). In this perspective, MIL educational practices that involve participation and transcultural collaboration with the use of contemporary technology need more attention of researchers in order to keep pace with the speed of the rapid development of our mediated society (Risvi, 2009).

The efforts of learning and creating knowledge around MIL have to reverse direction from top-down policy-to-educator-to-student to bottom-up direction and involve young generation that possesses up-to-date knowledge and experience of the new media and intuitively finds new ways of integrating technology in their life to develop solutions for and with the use of MIL to meet the needs of the reality they live in. Learning by doing shall enable the participants to take ownership in the process and in the outcome, as well as to help them understand the transcultural nature of the issues they end up working on. The objective of this current study is to discuss how to integrate the hands on learner-centred approach vividly presented in marker culture with MIL educational practice.

Concerns have been expressed about (a) maximising the ability of educators to adequately meet the needs of young people in the rapid pace of technological change; (b) finding collective practices to help the youth actively participate in media for making a positive change, and (c) influencing the current input for local and global policy-making in MIL. There have been years of mostly policy-oriented discussion on MIL, and very little academic research is available on the practical, youth- and learner-centered hands-on approach to MIL education. The top-down approach in MIL policy-making is also being challenged. Without experimenting around these issues MIL education policy risk to become too theoretical and academic in nature, tending to be detached from the real world issues.

This study attempts to address the above mentioned points through presenting and discussing an experience of organising an event for the annual Global MIL Week 2018 led and supported by UNESCO. The event was named Global Media and Information Literacy Youth Online Hackathon (further regarded as GlobalMILHack) and was later extended into a 4-week online follow up programme described further. The idea was based on my previous work experience in participating and organising hackathons: StartupWeekend Helsinki in 2016 - as a franchise event of Techstars Startup Weekend; CityHack Tuusula in 2017 - a community event ordered by the municipality of Tuusula; and SomeJam Tampere in 2018 - an event for Tampere high school students led by the Tampere University students in Media Education MDP).

GlobalMILHack project was a 3-day event introduced in the framework of the Global MIL Week 2018, with an objective to engage young audiences in a new form of a collaborative and results-oriented activity, while also educating these audiences about MIL. The GlobalMILHack project originated with the intention to find a new engaging way to involve UNESCO MIL youth audiences in collaborative activity and achieve long-term feasible results. It resulted in driving action and enabling participants to take an active citizenship position towards existing social issues.

The Week was led by UNESCO and UNAOC in partnership with the MILID University Network, the Global Alliance for Partnership on MIL (GAPMIL), the International Federation of Library Associations, the International Association of School Libraries, and many other partners (UNESCO, 2019). Within the Week there were two major events: the Global MIL Week Feature Conference in Kaunas (Lithuania) co-organized with and hosted by Vytautas Magnus University between 24th and 25th of October, and Youth Agenda Forum - co-organized with and hosted by University of Latvia in Riga on October 26th. These main events were meant to also celebrate an important milestone – the 100th anniversary of independence for the Baltic States - Estonia, Latvia, and Lithuania. Work on GlobalMILHack involved two more Media Education students, three partner universities (Tampere University, University of Latvia and Vytautus Magnus University), three members of UNESCO MIL Programme and MILCLICKS, eight members of GAMPIL International Steering Committee, and six mentors from Finland, Portugal, Luxembourg, the United States, Nigeria and India to volunteer for helping, promoting, mentoring and judging at GlobalMILHack.

Several international partners supported and collaborated with me on this project to create and boost awareness of the hackathon: UNESCO MIL Programme and UNESCO MILCLICKS, Global Student Square (USA), University of Latvia, Vytautas Magnus University and Tampere University. In the framework of the UNESCO's Youth Spaces Initiative, under the supervision of Alton Grizzle and in close consultation and collaboration with UNESCO's Communication and Information Sector, my role was to facilitate the hackathon as an Individual Specialist through various digital communication channels such as email and social media. The hackathon was conducted fully online in English and the participation was open for all young people from anywhere in the world that qualified to their country-specific age criteria for youth - a requirement introduced by the UNESCO

MIL team to keep the focus on their young audiences. Between October 24th and 26th, 2018 the hackathon involved more than 80 remote participants from 23 different countries, and resulted in 13 team projects, nine of which were chosen by a committee of UNESCO and invited GAPMIL representatives to continue on to a follow-up 4-week programme funded by UNESCO Youth Spaces Initiative (YSI). During the 4-week programme teams developed current concepts into concrete budgeted action plans in the form of Concept Note documents to be presented to the evaluation committee for final selection and funding. Eventually, the evaluation resulted in five teams receiving approval for their project budgets.

Research in the field of design has brought up a body of research on *hackathons* - timed, collaborative, problem-solving social events (Leckart 2012; Zukin and Papadantonakis 2017). They have been praised by their versatile design framework - the "maker culture" that has been observed in the existing ethnographic studies of hackathons (Taylor, 2016; Blikstein & Krannich, 2013). The maker culture has shared characteristics with constructivism ideas of Piaget (1970) and collective, collaborative social learning of Vygotsky (1962, 1978). This is where the educational processes of maker culture (searching and choosing appropriate information, application of it to problem-solving, communication and collaboration in a community, peer assessment) go parallel with the participatory methods in MIL education described by Frau-Meigs (2015) and Jenkins (2016) as a new discursive trend to the citizenship model, which addresses MIL from the perspective of engaging in public sphere and fostering participation and agency. Few researchers came as close as claiming that hackathons help formation of publics - groups concerned by an issue (Dewey, 2012; Lodato and DiSalvo, 2016). However, academic research is still missing evidence on the impact hackathons have on development of MIL skills.

The current research sets the hackathon design framework at the centre stage. Thus, the focus is set on merging participatory action research (PAR) and design research (DR) together in the framework of a newly introduced participatory model - an online MIL hackathon designed and executed with the support of UNESCO.

Mixed methods are used in this study, due to the diversity of activities and touchpoints with the participants. Those methods are semi-structured qualitative interviews with participants, online

questionnaires, analysis of their final works (further regarded as Concept Notes, or CNs), and my own observations of their activity progress through the time of the study recorded in personal research diary. To analyse all of the above this study implements thematic analysis of the gathered data.

This research study undertakes a qualitative examination of the GlobalMILHack participants' experiences in order to find out what results/implications can be seen from introduction of design method in problem-solving as an international online activity to promote and educate about MIL. This study adds to knowledge about participants' engagement levels and perceptions of using MIL in finding ways to solve current global and local problems related to MIL and Sustainable Development Goals. The study offers insights on how teams have worked within a connected online multicultural environment and what were their learnings and impressions of the new educational concept of a hackathon. Conceptually, this study participates in academic discussion of MIL and digital citizenship education (DCE). As a societal objective it sets to help international educators, pedagogues, education researchers and experts, and learning technologists to understand and adopt design hackathons such as GlobalMILHack and foster intercultural dialogue and collaboration. On a broader scale this study is influencing policy makers towards taking more inclusive, holistic, multi-stakeholder approach for advancing MIL and digital citizenship policy.

The first section of this proposal so far has given the background of the current study, setting the scene for the event of the Global MIL Youth Hackathon and the 4-week follow up programme. The paper will now continue with the second section providing an overview of the literature around the concepts of participatory culture in media pedagogy, focusing on the paradigm of "maker culture" in the lens of constructivism; and takes the concept of hackathons into a pedagogical design perspective, and reflects it the light of empowering remote communities. The third section looks closer at the design of the hackathon and the programme, explains how the participatory action research was used to gather the qualitative data. Section four continues with presenting the results of the research and continues with thematic data analysis in section five. The paper concludes with the outcomes of the study, the implications for educators and for the further research.

2 TOWARDS MEDIA AND INFORMATION LITERACY THROUGH MAKER CULTURE

We live in a moment of a profound and prolonged digital media change, which is taking place all over the world, bringing more and more opportunities for people to participate in cultural co-production and circulation. We create and share media with each other on a bigger scale and in a faster pace than we could ever done before. Being caused and fuelled by the advancement of information and communication technologies (ICTs), our media participation is argued not to be a property of the technology itself, but rather as an outcome of our choices and decisions (Jenkins, 2015). As other choices and decisions we make in our lives on a daily basis, those that are co-influenced by media, in turn, have influence on our own life beyond digital and the life of others in our close and distant digital circles. The power of our decisions, big and small, and its influence that may or may not be always of a positive nature, bring up the importance of studying and educating people about the responsibilities that come with the power.

Rizvi (2009) suggests that contemporary education must produce new kinds of subjectives: people become lifelong learners, who need to be able to work creatively, to be flexible, adjustable and mobile, and also be globally-oriented and act confidently in a multicultural environment (Risvi, 2009, p.11). Frau-Meigs and Torrent suggest that "media and information literacy (MIL) can be seen as one of the tools for such neoliberal project in enabling action and learning in a global media environment" (Frau-Meigs & Torrent, 2009). This statement represents the leading vector of the upcoming discussion, however, before discussing MIL any further, it is important to take a side step and explore the concepts of *hackathons* and *maker culture* more in detail.

2.1 Maker culture in hackathons

Hackathon, term derived from **hack** and **marathon**, roots back 50 years to programming at MIT (Leckart 2012, Zukin and Papadantonakis 2017). During the past decades, the phenomenon

evolved first to IT-community-wide co-creation events between project managers, graphic and interface designers that usually lasted for one or two days. Today, the hackathons have spread beyond the conventional tech world to educational, creative, corporate, and government sectors due to its inclusiveness, so called come-one-come-all ethos (Briscoe and Mulligan, 2014; Kienzler and Fontanesi, 2017; Leckart, 2012; Zukin and Papadantonakis, 2017). However, the thorough descriptions of hackathons in education and particularly pedagogy's role are missing from the literature.

A hackathon is a vivid example of **maker culture**. Proof to this statement we can find in the works of multiple researchers (Agre, 1997; Kuznetsov and Paulos, 2010; Lindtner and Li, 2012), who agree that the concept of hackathons relate to broad trends in "making" in society. Few authors (Vakil and McKinney de Royston, 2018) theorise that the design on the hackathon is based on a Freirian-inpired problem-posing pedagogy (Freire, 1970). This pedagogy shares similarities with inquiry-based or problem-solving approaches in science and mathematics (e.g. Sotta&Linn, 2009; Schoenfield, 1992), but emphasises youth themes that are significant and relevant to their local and global contexts.

Traditionally, when participating in a hackathon, attendees collaborate in developing technical systems, such as applications, software, or visualisations. Success or failure comes from how well a system addresses its intended objective, and a technical artefact is vital for a valid argument (Agre, 1997). Hackathon activities are also limited by time. Beyond these general characteristics, hackathons vary greatly, yet Disalvo (2015) identifies trends that have emerged giving more shape to these events. One of those is a move toward what is called **issue-oriented** hackathons (Lodato & DiSalvo, 2015, 2016). These are events are organized around a social topic or context, such as environmental well being, food systems, or citizenship, rather than being organized around a technical platform (e.g. smartphones). Attendees are presented with problems or opportunities, called **challenges**, and groups form around these challenges for the duration of the event. At issue-oriented hackathons, Vakil and McKinney de Royston (2018) continue, participation in design things occurs as participants are guided through a process of identifying a significant social issue in their community, working collaboratively to analyse the issue, then proceeding to brainstorm ideas for "solving" or addressing the problem through the design of a product or service. They then are

expected to give form to prototypes envisioned to address the conditions and consequences of the initial issue or the challenge.

In hackathons, Vakil and McKinney de Royston (2018) agree, designing is improvised through making rather than forethought. This characteristic has found new name in 1972 in the book of Charles Jencks and Nathan Silver that was titled "Adhocism: The Case for Improvisation" (Jencks and Silver, 2013). Notably, the book has recently been re-released, with a new introduction discussing the role of the ad-hoc in contemporary architecture, design, and social and civic life. The key to adhocism, authors formulate, is the use of at-hand materials to solve problems in the moment. Additionally, ad-hoc design is characterized by adjustments to the scope and outcome of a prototype during making. Rather than assessing feasibility before development (i.e. the availability of skills, resources, and time), design and development are conjoined. Ad-hoc design constitutes a mode of continual, rather than iterative, assessment, on-the-fly adjustments, and emerging goals. These practices, in turn, link to the Flexibility & Adaptability competences as well as Co-operational Skills from the CDC Model. Lodato and DiSalvo (2015) argue, what they witness at issue-oriented hackathons is a mode of adhoc design, and that such a practice has value to participatory design and innovation, especially in relation to notions of design things and publics.

2.2 Maker Culture As an Educational Paradigm in Constructivism

Research suggests, that the adoption of the maker culture as an educational paradigm can be the source of pedagogical innovation since it transforms the learning activity from a teacher-imposed task to an **interest-driven** challenge that can overcome the separation between academic and industry-oriented skills (Trauth, Farwell, & Lee, 1993). Interest-driven, in this case, refers us to the learner-centered approach in pedagogy, described in the works of Lev Vygotsky (1962, 1978) who, as well as Jean Piaget (1970), has done research on learner-centered pedagogy. In his works, the teacher is the one who guides learners' cognitive process, rather than the one who only transmits knowledge (Kincheloe 2003; Smith et. al. 1997). Frau-Meigs, in turn, adopts this philosophy to MIL teachers, strongly emphasising e-skills for MIL and socio-constructivist outcomes for learners, regardless of their age. Here we also have to acknowledge Bers (2008) for pointing out that in contrast to Piaget, Vygotsky switches from viewing learning as an individual experience, classic to constructivist Piagetian theory, to learning as a social process. This pedagogical switch, Bers (2008)

synthesises, “occurred concurrently with the fast-growing uses of the Internet in education and the development of virtual learning communities.”

In media literacy education works of Vygotsky (1978) and Piaget (1970) found continuation in works of Smith et al. (2005) who emphasised the importance of participating in real-time in connection to effective learning experiences. Rheingold (2008) manifests participatory media literacy as “an active response to the as-yet-unsettled battles over political and economic power in the emerging mediasphere, and to the possibility that today’s young people could have a say in shaping part of the world they will live in — or might be locked out of that possibility.” He motivates that if students are educated about how media is or can be used to inform, propagate, contest and foster action, especially regarding the challenges that they are personally concerned about, they may make the first step towards building up their understanding of citizenship. (Rheingold, 2008). When discussing citizenship, as Kupiainen and Sintonen (2009) acknowledge, basic things such as the access to the Internet and digital information in education have increasingly been seen as major factors in defining citizenship (Kupiainen and Sintonen, 2009, p.21).

2.3 Educational practices in participatory media

What the discussion arrives here is the question of “how” or “in what way” educators can implement real-life participation into effective learning experiences, in other words, what would be considered a relevant **educational practice**?

Rheingold (2008) outlines practices, in which participatory pedagogies can be used by educators to activate youths’ public voices via online platforms, as well as to build strong connections to civic and political issues about which they care. In participatory media he includes blogs, wikis, RSS, tagging and social bookmarking, music-photo-video sharing, mashups, podcasts, digital storytelling, virtual communities, social network services, virtual environments, and videoblogs.

Jenkins (2006) realises that young audiences themselves are already being part of the participatory learning process developing the skills, knowledge, ethical principles, and self

confidence necessary for taking part in the modern culture. Among other examples, he mentions **collaborative problem-solving** as a way, in which, he claims, the participatory learning happens.

2.4 Collaborative problem-solving and informal learning environments

Let's zoom in at the collaborative problem-solving.

As a skill, in the works of Lemke (2004), Trilling and Fadel (2009) and Kumpulainen et al. (2011) problem solving and collaboration consistently come as two most crucial learning requirements on 21st century, along with critical thinking and communication, creativity, and new literacy and media skills. Authors complain that these are hard or sometime not possible to promote if educational environments are bound by a specific space and time, or are led and controlled only by the teacher (Trilling and Fadel 2009; Lemke 2004; Kumpulainen et al. 2011).

As a new participatory culture, among others noted by Jenkins (2006) above, collaborative problem solving represents an ideal informal learning environment. Intensifying the contrast between informal and formal learning, Jenkins elaborates that informal learning surrounding popular culture is often experimental and innovative and the structures which sustain it are more provisional, while formal education is often highly conservative and static with more institutional structures. Responding to urgent needs and short-term interests is faster in the informal learning communities which are adhoc and localised, whereas the public education institutions do not change much, in spite of continuous education reforming coming from national-scale institutions. People are mobile inside the informal learning communities, while if their needs are not met by formal education, it is a lot harder to change the setting. (Jenkins, 2006).

Similar qualities characterise **affinity spaces** - the term appearing in the works of education professor James Paul Gee (2004). He looks for reasons behind observing people being more active learners and participants when dealing with popular culture than when dealing with literature and textbooks. His research suggests that the opportunities that are created for the learners in affinity spaces are more powerful since they take place in formats and scenarios that "bridge across differences in age, class, race, gender, and educational level"; because participants are active in the ways suitable to their talents and passions; because, as again in earlier constructivist studies, learners are involved in peer-to-peer teaching where every one tries to gain new knowledge and

improve their skillset; and finally, because affinity spaces create an opportunity everyone to share their own expertise.

Such inclusive nature of affinity spaces rises a question, and perhaps, a challenge of different interpretations by participants. Pathak-Shelat et. al. (2015) foresight that youth, media, globalisation and participation are influenced largely by the political and historical aspects and therefore their form changes from one location to another. Researchers suggest that international youth may interpret concepts, such as participation in media for example, very differently (Pathak-Shelat, Kotilainen & Hirsijärvi, 2015, 388-389). This notion brings **intercultural dialogue** in the spotlight. Here, one can refer to the European Council's CDC Model, as in its framework intercultural dialogue is defined as "an open exchange of views, on the basis of mutual understanding and respect, between individuals or groups who perceive themselves as having different cultural affiliations from each other". Forward-looking educators, therefore, may rise a logical question of how, taking in accountability the difference in political, cultural, and demographic factors, to design an affinity space or an international learning environment for education and foster intercultural dialogue?

Researchers suggest that one way to reduce barriers in the learning process is to shape education around competitive platforms. Johnson and Johnson discussed several strategies of adapting pedagogy to include cooperative, competitive, and individualistic learning in the classroom (Johnson&Johnson, 1978). Competitive events provide an excellent venue to facilitate learning since they simultaneously enforce a structure (i.e., rules of the competition) and allow for out-of-the-box and imaginative thinking. Hackathons are good example of competitive events. Among the hackathon trends, DiSalvo (2015) mentions a move towards the professionalisation of hackathons. Many hackathons today have corporate sponsorship, significant prizes, and in some cases, even venture capital for winners. This aspect has also being taken into the account while planning and designing the hackathon experience and is discussed further in the Methods and Research Design chapter.

After mapping the main concepts related to hackathons (maker culture, adhocism, constructivism, participatory media practices, affinity spaces and intercultural dialogue) it is time to proceed with the discussion on the other focus of this study - media and information literacy.

2.5 Definitions of Media and Information Literacy for Digital Citizenship

Pedagogic aspirations related to Media and Information Literacy (MIL) are becoming part of policy frameworks, which should allow young people to make informed choices about media use, exercise their right to participate in society, and become capable and creative agents within the evolving media ecology (Livingstone et al., 2014). Frau-Meigs supports by naming promotion of civic and political participation and e-democracy as one of the main concepts and values in MIL policy (Frau-Meigs, 2016). MIL, advocates conclude, is inextricably bound up with human rights and freedom of information and expression.

To continue the conversation, it is important to discuss what is actually understood under the concept of MIL. As this topic has been in the centre of ongoing debate in the research world, the definitions of it vary. Therefore this paper takes a step aside to cover most of the relevant concepts that emerged in the relevant literature before moving further and connecting MIL to the study.

Officially established in the Fez Declaration in 2011, the concept of MIL has emerged from the earlier concepts of media education (ME) and media literacy (ML). In the UK research on these concepts Buckingham (2005) explains the difference between media education and media literacy as media literacy being viewed "more broadly, as a kind of cultural competence - a matter of understanding of how the media work, of being able to access and evaluate what you see, and to match it to your needs as a consumer. Education is seen here as one (although by no means the only) way of promoting media literacy" (Buckingham, 2005, p.4). Sonja Livingstone (2004) discusses the four major points in understanding media literacy: access, analysis, evaluation and content creation. Although, David Buckingham mentions analysis and evaluation as parts of media literacy, too, Livingstone adds two more: access and content creation, where access underdetermines media use and contact creation means the practical use of the generated knowledge from previous steps.

Turning to the US research, media education is also understood as a multidisciplinary research field taking its roots in the second half of the past century - in constructivist ideas of the French theorist Jean Piaget (Kincheloe, 2003). Knowledge, in general, according Piaget, is not ready-made as each of us is continually creating and restructuring our own knowledge (Piaget,

1970). American researchers Kincheloe (2003) and Carey (2009) see constructivist notion in media education: learners build new skills and knowledge on their previously gained experiences themselves during the communication process with others.

The outcome of media education is the ability to make "one's own judgement on the basis of the available information" (Krucsay, 2006), which goes in line with how American academics describe media literacy. Likewise, across past decade Potter (1998) and Mihailidis (2014) agree that media education leads to media literacy. Potter defines media literacy as a "perspective from which we expose ourselves to the media and interpret the meaning of the messages we encounter" (Potter, 1998). Being media literate, in his opinion, means staying mindful while being exposed to any information and thus keeping control over own set of beliefs and behaviours.

Along with internet governance, researchers has included MIL in "the new basics" of education 3.0, since it has potential to develop co-operativeness, creative and innovative thinking of young people, aid their understanding of human rights and shared values, that they will need eventually to become part of inclusive societies in the future (Frau-Meigs and Hibbard 2016). They emphasise education, particularly citizenship education and literacy to be the enabler for active participation. Martens and Hobbs (2015) support the view and position of media literacy as "an important resource to fulfil the promise of digital citizenship".

But what is meant by digital citizenship? Just to sense how broad the topic of digital citizenship is, we can look at the definition, given by the European Council, that draws together a range of closely related synonyms or concepts "including "Global Citizenship" (Parker and Frailon, 2016; UNESCO, 2015), "Global Competence" (OECD, 2016b), "Digital Competence" (Ferrari, 2013; Vuorikari, Punie, Carretero Gomez & Van den Brande, 2016), "Digital Literacy" (Canada's Centre for Digital and Media Literacy, 2016) and "Media and Information Literacy" (Frau-Meigs & Hibbard, 2016; UNESCO, 2013) and incorporates the three key elements of digital engagement, digital responsibility and digital participation brought about through the critical analysis and the competent use of digital technology underpinned by a concept of citizenship founded on respect for human rights and democratic culture." (Council of Europe, 2019). In literature the concept of citizenship has been tightly connected with individual rights and obligations that come with of

living in a community (Impero, 2016). With the turn of the information age, researchers observe, citizenship in concerned with online community life, too. No matter how different online and offline worlds could be, any individual must be digitally competent enough to sustain active citizenship position: this entails positively engaging with digital tools in various aspects of civil life (political, economic, social, cultural and intercultural), continuously educating oneself in formal, informal, non-formal settings.

Parker and Fraillon (2016) view DCE as "situating global citizenship in an educational context, describing the knowledge, skills, values and attitudes fostered through teaching and learning about global citizenship" (Parker and Fraillon, 2016). DCE aims at fostering learning opportunities for young people to be proficient, engaged and creative online (Kids Define the Line, 2013). Appropriate DCE framework is also incredibly crucial in teacher education and shall be integrated into through a holistic approach (Guo, 2014) . Unfortunately, the challenge remains in the slow adoption of global citizenship education among the conservative teachers. Apart from teachers, other stakeholders such as parents and guardians, youthworkers, and young people themselves shall be engaged in DCE in formal, non-formal and informal educational contexts.

Similarly Jenkins (2006) talks about the increased digital media literacy education: it provides the skills and opportunities that will enable active participation in the public sphere. These skills he calls "the new media literacies" – a number of competencies and skills needed by a youngster as s/he comes across a new medium. These cover numerous social skills that are used to collaborate and network. These skills are rooted in traditional literacy, research, technical, and critical analysis skills (Jenkins, 2007).

Similarly to Jenkins suggesting an umbrella concept of new media literacies, Frau-Meigs integrates media literacies, media skills and communication into conceptualisations of multiple literacies as transmedia literacies (Frau-Meigs, 2011). Following her work, **transliteracy** points to the multimodal literacies fostered by the digital era that impact all school topics. It strongly links to convergence of media online, which produces a wealth of information cultures as the very definition of information expands to news, documents, and data (Serres, 2012). The emergence of transliteracy, as a unifying notion around information cultures, can provide an answer to maintain

the priority of critical thinking, citizenship, historically attached to media education over the market-driven trends towards code of literacy. Boundaries of MIL point to the fact that MIL, as transliteracy, could be the basis for the new 21-century competencies (Frau-Meigs, 2013). Additionally, Frau-Meigs concludes that "MIL tends to be a project-based pedagogy with less formal assessment methodologies, or at least to be considered as such." Other work suggests that many more traditionally conceived literacy skills, such as interpersonal skills and strategic planning, can be effectively taught through digital media because of youths' familiarity with, and regular use of, new media (Buckingham, 2003).

As it can be seen from the abundance of concepts and definitions presented above, the terms of media education, media literacy, digital literacy, digital media literacy education, transliteracy, digital citizenship, digital citizenship education and media and information literacy are closely related to each other and, therefore, when discussing one concept, we cannot forget about the influence it has on and from the others. Setting the definition debate aside, I am going to proceed with the concepts of media and information literacy and digital citizenship as the key ones that I will be looking at in this current study.

2.6 Linking Maker Culture and Hackathons to MIL and Digital Citizenship

Since the connection within the key groups of concepts - maker culture and hackathons on one hand, and MIL and digital citizenship on the other - has been already established, a logical question to ask now would be whether there is a possible connection between the two groups? Does the existing literature offer a relationship of the concepts that would enhance the conceptual framework? As the following few paragraphs of this concluding chapter show, there is not one, but two essential touch-points.

First one refers to maker culture and MIL building certain skills. Deriving from the work in a contiguous research area of STEM education, Taylor (2016) states that despite the continuing debates around the definition of the term **21st century skills**, "scholars, policy makers and practitioners converge on the notion that students need to develop higher-order, domain-independent skills such as critical thinking, reflection, collaboration, and self-regulation. These

cognitive, meta-cognitive and social skills, in his shared opinion, serve as a basis for acting autonomously and responsibly in a complex information society and relate closely to **maker activities** (Taylor, 2016). Maker scenarios or FabLabs (Fabrication Laboratories) have been identified as a basis for new educational approaches (Blikstein & Krannich, 2013) where the maker culture extends beyond the actual products to the process of creating an artefact in a social arena (Dougherty, 2012; Sharples, McAndrew, Weller, Ferguson, Fitzgerald et al., 2013). During this process, makers learn how to search and to choose appropriate information, how to apply it in order to solve problems, how to communicate and collaborate in the community and how to evaluate one's own practice. This is where the above mentioned maker scenarios go parallel with the participatory methods in MIL education described by Frau-Meigs (2015) as a new discursive trend to the citizenship model, which addresses MIL from the perspective of engaging in public sphere and fostering participation and agency. "This [participatory] model enriches participation with cooperation, and collective tasks such as media and ICT technologies have become easy to implement, with reduced costs and increased functionalities (memory, editing, broadcasting, micro-blogging, etc.). It functions on social networking and on co-design, the co-construction of knowledge, etc." (Frau-Meigs, 2015).

Second touch-point is shared by the concepts of hackathon and citizenship. People use digital technologies to participate as global citizens, which form their understanding of themselves as the ones who belong to a broader community and see the dependencies between politics, economy, society and culture, across different levels (UNESCO 2015). Such process demands the ability to critically analyse the issues on a global and intercultural level, ability to understand the way social and other differences affect opinions and willingness to engage with people from different backgrounds in equal and respective manner (OECD 2016). As it was earlier mentioned, issue-oriented hackathons put focus on vital social issues that are often politicised in media. By making a decision to join a hackathon on a particular issue, the participant identifies his/herself with the issue and becomes an active part of civic discussion - on the local or on the international level, depending on the scale of the event. Since hackathons are usually open public events, they serve as a great arena for showing what the participant really cares about and finding like-minded people - within and across cultures - which involves intercultural dialogue. Interestingly Lodato and DiSalvo (2015, 2016) lay out a paradox of issue-oriented hackathons in "the attempt to create alignments

that are temporary, and thus weak, with regards to long-standing issues." Authors suppose that if we accept the partialness of this engagement, hackathons shall be considered as prototypes for more substantive engagements. "In other words, the temporariness need not be problematic - we might consider hackathons as **prototypes of publics** - a term drawn from the work of American pragmatist John Dewey (Dewey, 2012) that refers to the formation of groups concerned by an issue. Lodato and DiSalvo (2015, 2016) apply that this development of publics might be quite useful if intentionally pursued. Like any prototype, these proto-publics provide insight into useful, usable, and desirable features of a public. Practically speaking, a mixed hackathon team of multi-disciplinary professionals and students that are working on one social issue that they care about represent a prototype of a larger diverse society that can be drawn to the same issue. By adding the diversity element to the background of the group members, the prototype gains intercultural qualities. "Usually", Lodato and DiSalvo continue, "this insight is directed toward the application or service under development, but this insight could also be directed to the constitution of the public itself." That is, if we see design as a way of contributing to the construction of publics (DiSalvo, 2009), then issue-oriented hackathons could provide insight toward that goal. Specifically, these proto-publics could provide means to arrange and align different skills, capacities, interests, material resources, and activities toward articulating and addressing issues in future endeavours. Proto-publics serve as test sites to understand the character of participating with regards to a particular circumstance or issue (Lodato and DiSalvo, 2015, 2016). Further in the chapters of this research paper the idea of proto-publics is applied to the hackathon and the programme teams. Results of their work and individual feedback of their members, assessed in the analysis chapter, prompts recommendations to what is needed by such proto-publics to become more substantive engagements in the future.

Conclusion

Although both concepts of MIL and digital citizenship are complex to define, in the context of education digital citizenship is a multi-competence area that involves the learners' values, skills, attitudes, knowledge and critical understanding required in the digital era. These competences embed MIL, which is viewed as an enabler for active digital citizenship. Intercultural dialogue mobilises the entire cluster of competences and therefore plays a big role in implementation of MIL.

Furthermore, media and information literacy as well as digital citizenship education are needed across all educational contexts and stakeholder audiences to make digital citizenship sustainable. Collective knowledge construction, collaboration and problem-solving shall be included in the participatory educational practices to prepare youth to the requirements of being an active citizen in today's mediated world. Maker culture and adhoc design of hackathons activate those skills and are valuable factors to participatory design and innovation, especially in relation to notions of design things and publics.

The main question of this research study is **how to bring maker culture into MIL educational practice through online hackathon?** The supporting sub-questions are:

- first, what are the learning outcomes of such worldwide hackathon; and
- second - how are those learning outcomes related to active citizenship?

3 METHODS AND RESEARCH DESIGN

This chapter aims to tell about how the research study was implemented. It starts with describing the design of the study, structure and format of the GlobalMILHack follow-up programme more in detail including the event's agenda, the deliverables, and the tools used throughout the work. The chapter continues with the definition of action research methodology and its application to my case. The Data Collection sub-chapter follows with describing the kind of data I managed to collect and why the particular data was picked for the analysis. The chapter concludes with the framework for data analysis.

3.1 Action Research Methodology

Greenwood and Levin suggest that action, research and participation are the three elements that action research refers to (Gleenwood & Levin, 2006). Thomas (2013) adds that action research is undertaken by practitioners for the purpose of helping to develop their practice and done at the same time as performing the practice. He continues that the central aim of action research is change and the emphasis is on problem-solving in whatever way seems most appropriate. I took part in all stages of the process starting with planning, to executing, to collecting and evaluating the collected necessary qualitative research data, I consider that action research method is the most relevant one for my study.

Other authors view action research as a participatory and democratic process, which plays role in the development of 'practical knowledge for worthwhile human purposes" (Reason & Bradbury, 2001). In their opinion, action research method aims to unite acting and reflecting, theory and practice, to arrive to practical solutions to the troubling and important questions. Therefore, in doing action research the researcher is required to be actively involved in a participatory action.

Four cycles have been outlined in the process of action research: planning, acting, observing and reflecting (Kemmis & McTaggart, 2005). In case of this study, this cycle spans two times, once for each part - the hackathon and the followup programme. Each cycle involved me as a researcher: I planned and agreed the structure and the deliverables of the hackathon and the programme with the UNESCO MIL Programme team, discussed the ideas of the hackathon challenges with and Professor Sirkku Kotilainen. During the course of the hackathon and the programme, my main tasks were facilitation and a mentorship to the teams, keeping regular contact with the them and monitoring their activity and progress. Each time we had a meeting, I recorded my observations into the research diary.

One of the reasons I chose action research for this study is that it helps building practical knowledge, that may influence participants' beliefs and actions. Reason and Bradbury (2001) take a broader view on the mission of action research as a contribution to the development of well-being of communities and individuals. This justifies the reason I, as a researcher, personally favour action research - its humanistic purpose resulting in developing lives of people.

What makes action research even more attractive is the fact that, in contract to social science, action research aims further than understanding of the social arrangements. It strives to influence the desired change as a path of generating knowledge (Bradbury-Huang, 2010). In this way, adding to the above mentioned view of Reason and Bradbury, in addition to being practical knowledge becomes also transformative, because of fostering change in existing human environment.

This study attempts to influence the way hackathons are perceived in the society and in particular in media literacy education and develop a potential way of using hackathons for promoting active digital citizenship. Hackathons should be studied, particularly with emphasis on the transcultural collaboration and learning. Understanding how to address real world issues through such tools as issue-oriented hackathons from the perspective of a participant might help to develop one's self-esteem and confidence in acting as a responsible active citizen online and offline. Thus, practical and transformative knowledge is what this action research attempt to seek (Vygotsky 1978, Piaget 1970).

3.1.1 Planning Stage 1: Designing GlobalMILHack and the Study

The study was designed to take place over the course of four weeks of GlobalMILHack followup programme that took place between 19th of November and 14th of December 2018 as shown in the figure 1. Here it is important to note that since the 4-week programme is an outcome of the 3-day hackathon, it is more logical and relevant to this study to include data from both events, although this would mean that the hackathon data is included post-factum. Hence, the following sub-chapter describes the design of both the hackathon and the programme.

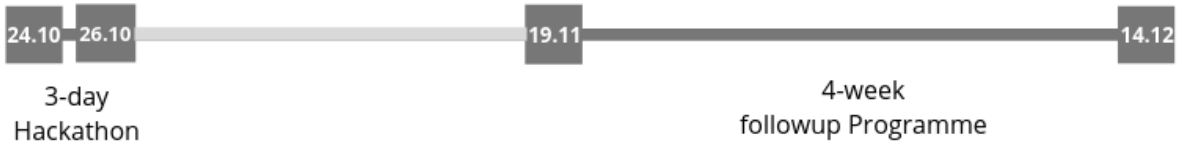

Figure 1. Timeline of the Global MIL Youth Hackathon and Programme.

The study participants were asked permission to use their feedback and information they provide during the four-week programme both in oral and write forms. More discussion on ethics aspect of this study follows in the Evaluation of the Study chapter later in this paper.

The objectives of the hackathon were to promote media and information literacy and to engage international audiences in a shared collaborative activity that is aimed at long-term results. The design method of the hackathon aimed at:

1. creating new services and tools for MIL promotion and education (practical aim of the study),
2. building the domain knowledge around MIL (an educational aim of the study) through doing a research on the current situation around one of the five given hackathon challenges, and
3. creating an opportunity for remote participants to exchange opinions and ideas across boarders for gaining transcultural understanding of current issues around MIL (a transformative aim of the study).

3.1.2 Acting Stage 1: Preparation and Activities of the GlobalMILHack

The preparation period for GlobalMILHack started in May 2018 and lasted until the start of the event in late October. Main activities that I had to work on within that period were:

- selecting and defining the most relevant issues connected with media and information literacy;
- opening a call for registrations for the hackathon via a press release on UNESCO official website;
- building a website with the necessary information about the event and the online sign-up form to collect the registrations;
- organising the mentors that helped the teams thought the process;
- building a judging criteria for the invited judges to assess the final projects;

I started by consulting with my Master Degree programme professor and the Programme Specialist from the UNESCO MIL Programme team about the possible themes for the hackathon challenges. In the end of our discussions we arrived to three key issues, in which MIL play a big role:

1) Children and Youth in Media
2) Disinformation
3) Media Immigrants

and two opportunity areas that concern MIL:

4) Sustainable Development Goals
5) Dialogue

For each of these five challenges I wrote a brief description and displayed them all on the website and along with corresponding links to an online registration form. For building and hosting of the website I used an online website constructor wix.com. The website visitors were invited to choose one challenge out of the five and register via the form. The form was built with Google Forms cloud software and recorded personal demographic data about the participants, their professional background and reasons for joining the hackathon. The official call for registrations was made with the published press release on the official website of UNESCO on October 4th (UNESCO, 2018) and the followed social media posts on Facebook and Twitter. At the same time I have also created a Facebook event to promote the hackathon. One of my classmates from Tampere University volunteered to manage the Facebook event and share promotional posts about the

hackathon challenges, the team and the mentors. Registrations for the hackathon were accepted until the deadline 23:59 CET on 21st of October 2018 and then were exported to an Excel sheet and screened for age criteria. The screening process resulted in accepting 72 registrations out of 88 that came in before the deadline. Applicants whose age was above the stated criteria and whose background has shown substantive professional experience in media, information technology and education were invited to participate as mentors to the teams. Instead of assigning them to a team, I asked them to provide me with the time slots during the days of the hackathon when the teams would be able to contact them for advice via email.

The accepted registrants were informed of the selection results and of their assigned challenge and team via email on the same day. Those emails also invited the recipients to join their respective team chats on Facebook Messenger by clicking on the link inside the email. Overall, 20 teams were formed by the start of the hackathon and each team had own Facebook Messenger team chat that included five people on average and allowed sharing multimedia content as well as audio and video group calls. Another student from my MDP who volunteered for GlobalMILHack, joined those chats alongside with me to co-facilitate the teams' conversations and to make sure that all participants had a chance to introduce themselves properly.

The other activities that I had to oversee were gathering of the mentors and preparing the judging criteria for the judging committee that UNESCO MIL Programme team were to assign. Eventually, six mentors among the hackathon applicants were assigned depending on their professional expertise and experience with media education. Their titles included Program Director, of an outreach initiative and Wikimedia usergroup which seeks to increase awareness of the Wikimedia and free knowledge, culture, and software movements among potential editors of African descent, Member of the Board of Directors of a New York - based non-profit community; a social entrepreneur and the Focal Person of a youth-driven organisation working in disadvantaged areas and areas prone to violence in Nigeria; Founder & Online Coach at a children multi-disciplinary learning centre in Luxembourg; Pharmacist and Research Scholar in the field of Nano-Biotechnology in India; a freelance journalist, graduate student in Media Education MA program in the Finland; IT Administrator / ICT and Computer Science Teacher in Portugal. The judges, on the

other hand, included the members of the Youth Steering Committee of GAPMIL, Programme Specialist of UNESCO MIL Programme and myself as a Media Specialist and a MIL Researcher.

Double Diamond Design Process Model

The hackathon and the follow up programme were developed as my personal initiative based on my previous experience of organising hackathons and working in media sector within Finnish startup ecosystem. From that experience I have observed that the hackathons in general follow the Diamond Design Process Model model which was found as the most proper to this occasion. The double diamond diagram was developed through in-house research at the Design Council in 2005 as a simple graphical way of describing the design process (Design Council, 2008). The model is presented in the Figure 2 below:

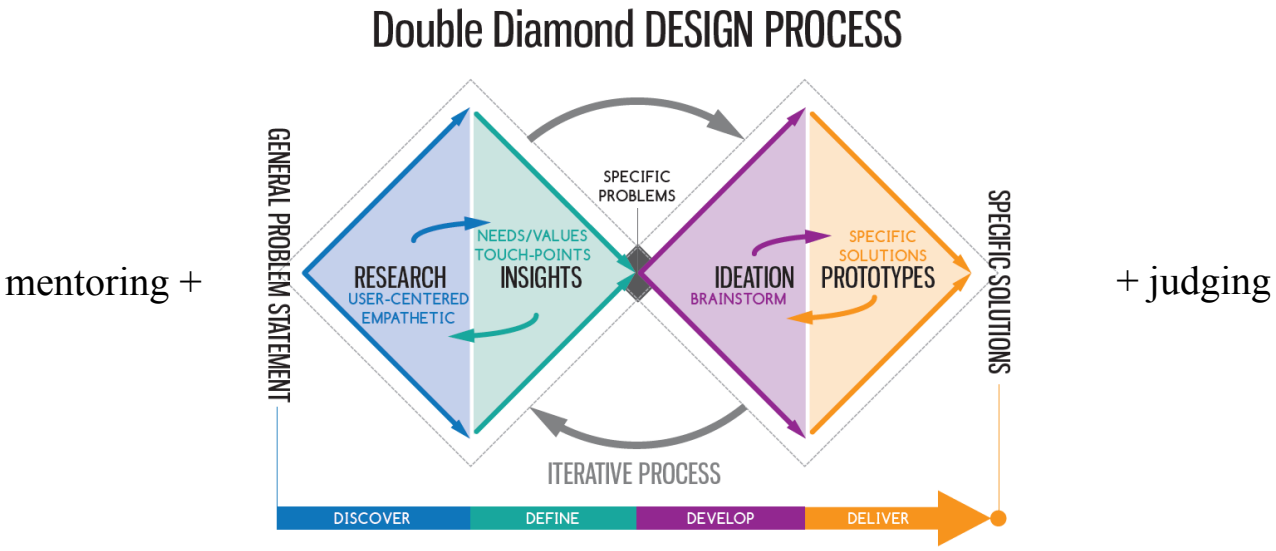

Figure 2. Double Diamond Design Process Model (Source: Service Design Vancouver)

In Double Diamond Design Process Model the design starts with posing general problem statement - the challenge that represents the main theme and problem connected to it. In this sense GlobalMILHack had five general problem statements expressed in the five above listed challenges. Each of those five challenges had a challenge description presented to the teams on the 1st day of the hackathon in the form of an online Google Document. The descriptions were more detailed than on the ones on the website, but general enough leaving enough space for individual interpretation by the participants. The reason for this was that the participants had to discuss the challenge theme with their team members and share their own perspective on the case. Teams had to diverge their

the views on the problem, share opinions and experiences, look for more data on the problem, collect and sort the information. The aim was to make the participants gain a transcultural understanding of the problem on a bigger scale. This corresponded with the first stage of the Double Diamond Model - research.

The second stage of the DD design model represents insights and requires convergent thinking about the problem, narrowing down to very specific problems including local-level perspective of the problem. Here the teams had to decide on the particular audience and its pain point which they were going to address in their project. The assignment that followed this stage was a fill-in Google form where they had to give their own team interpretation of the challenge from the bigger perspective and explain which specific problem in particular and on which level are they going to solve.

Third stage - Ideation - involved divergent thinking again, but this time - for generating as many ideas for the problem solution as possible. Often at this stage teams do **brainstorming**. This practice is largely used in design thinking because it sets the creative minds free and helps arrive to sometimes unexpected, out-of-the-box creative ideas. One rule that the participants had to obey at this stage was to accept and record all the ideas with no exception or criticism. Thus, all team members had a chance to speak and express their views.

Last stage is the one the teams had to spend most of the time on. The task of prototypes stage was to choose few of the ideas from the brainstorm stage, validate them by collecting feedback from the targeted audience(s) and visualise them in the form of digital prototypes and presentations. There was intentionally no requirement for the level of technical complexity of the expected solutions because the organisers wanted to see whether there would be any non-technical solutions presented at all. In case of GlobalMILHack most emphasis was put on idea validation step - teams had to collect evidence that their idea is viable and that there is a demand for it in public. The work process at this stage of the design model is expected to be very iterative: as the ideas evolve and get tested out in the audience, teams collect positive and negative feedback which prompts them to elaborate the idea further taking in account audience's concerns and test it again. The work process, therefore, goes in loops, for example, the team may realise that their initial understanding of the

specific audience's problem was incomplete or wrong and they need to go back from Ideation stage to Insights, refine their focus and brainstorm again. The decision-making process here is based not on the maker's personal opinion and initial understanding of the problem but on the insights collected throughout the stages of the process. Usually, the more loops the team makes at this stage, the more tailored and precise their solution becomes in the end.

For making the final presentations in video and PowerPoint formats (pitch decks) I have also provided the teams with a template and an example script. The requirement for the latter one was to record a video in MP4 format with a maximum length of three minutes explaining the core problem, the solution, the evidence of validating and collecting feedback from the chosen audience, and presenting the hackathon team.

Throughout all four stages of the hackathon progress I have been in touch with all of the teams via Facebook Messenger and email. However, since the project collaboration was quite intensive and demanded substantive amount of time from the participants over the whole period of three days , few teams have fallen apart due to inactivity. The hackathon resulted in 13 teams turning in their final presentations which I then summarised and presented to the audience at the Youth Forum at the University of Latvia in Riga. That presentation along with the rest of the forum programme was live-streamed on Facebook and the hackathon participants were invited to watch it online. In the end of my presentation a member from the UNESCO MIL Programme announced that the team projects will be reviewed more closely and the results would be announced later in November 2018.

After reviewing the 13 hackathon projects, the commission comprised of UNESCO MIL Programme team, the GAPMIL Representatives and myself made the decision to offer the selected nine teams to proceed onto a four-week online "incubation" programme in order to elaborate their ideas further and present them again in the new format that the UNESCO and YSI accepts for funding. Although this part was not initially planned for, all the teams had accepted the offer. At this point the selected teams as well as the other four were given certificates for their participation in the hackathon , but were not awarded with any funding. In between the end of the hackathon and

the start of the programme all participated teams were asked to fill in a hackathon feedback survey via Google Form.

3.1.3 Planning Stage 2: Designing the GlobalMILHack Follow-up Programme

The nine teams selected for the Programme accounted for a total of 43 participants based in 13 cities across 11 countries stretching from Cuba to India. About half of them came from different African states, while others represented North and Central Americas, Europe, Middle East and Central Asia. The vast majority of participants were in their mid-twenties and were doing Bachelor and Master level studies as well as working part-time. Their backgrounds were very different: many were studying and working in digital spheres (data science, security, analytics, digital media), in spheres of education and social work (various youth organisations, university teaching). One particular participant was a refugee living in Palestine and working as a dentist. It is important to note here that few teams were comprised of participants based in the same location, as for example were the teams from Cuba, India and Palestine, while other teams had their members spread across boarders and time zones. Not all of the participants spoke English fluently and therefore I made the decision to ask the teams to select the Project Manager that would be communicating with me throughout the programme on behalf of the whole team.

Facilitation of the process from my side included planning and organising weekly 1-hour online group calls for the participants and the UNESCO MIL Programme team as well as 30-minute individual team calls twice each week (on Mondays and Fridays) to monitor the project progress. The new tool that I decided to introduce at this stage was Google Hangouts because it allowed for online video and audio group calls for up to 25 users. The software also included a chat option, which I sometimes used for sending updates and sharing links with the call participants. Rest of the tools remained the same - I used Gmail for sending weekly agendas and schedules as well as the follow up emails after Monday and Friday sessions; Google Drive for sharing the working files and Facebook Messenger to send quick notifications and reminders to the teams.

To help me with managing the communication with the nine teams this time I invited a former student of the same MDP Programme at Tampere University. She was in contact with the teams via email and on Hangouts on a part-time basis and contributed to recording of meeting notes after each

call with the teams. Those meeting notes eventually turned into a part of my research diary for the current study, which I explain in the Data collection methods section further.

The design of the Programme followed the same methodology as the hackathon and was extended with few more tasks: firstly, the teams had to review their hackathon ideas from the perspective of MIL and consider strengthening the link of their initial solution to media literacy education; and secondly, they had to adopt a new project presentation format which included a proposed project budget breakdown (a Concept Note described further in the chapter) for presenting their ideas to the Programme judging committee. The judging committee this time was extended with the teaching staff members from the three partner universities and three more members of the International Steering Committee of GAPMIL.

The Concept Note was meant to be the only document that teams had to submit to the committee for the final evaluation. In the result of one team dropping out of the Programme, the committee received only eight Concept Notes by the deadline which was on 13th of December 2018. After the extended period of judging the result have been announced to the five selected teams that were approved for receiving project funding from the YSI. The final budgets ranged from 5,000 euros to approx.13,000 euros per project and were restricted for completing the planned activities by the end of 2019.

3.1.4 Acting Stage 2: Collecting Data From The Implementation

Since during the time of the study I was located in Finland and the participants of the study were in Central America, Middle East and Africa, and my research study did not intend to incur any additional costs for travel, my methods of collecting the data were all digital. The kind of data I aimed to collect was qualitative data gathered through:

1. teams' final projects (Concept Notes text documents with the project proposal information);
2. three qualitative online interviews with individual hackathon participants;
3. online feedback surveys (including qualitative questions regarding the hackathon experience);
4. my own research diary (with comments and notes I made throughout the facilitation process).

The data is easily accessible because the interviews were done with Google Hangouts, audio-recorded with my iPhone Voice Memos app and transcribed later, online surveys were collected digitally through Google Forms, the Concept Notes were sent via email to me in PDF formats and my own research diary was written partially in Google Sheets and offline in digital text editor Pages. The interviews took place between the submission of the final Concept Notes (December 13th, 2018) and the initial date for announcing the results (December 15th, 2018). Participants were asked to submit their online feedback surveys witting that time period as well. The analysis of the transcribed interviews, Concept Notes, filed notes and the online surveys took taking place within January and February 2019.

Concept Note

The Concept Note was the main deliverable of the Programme and its template was introduced to the teams in the first week of the Programme during group call with the UNESCO team. It was presented in an online downloadable and sharable Google Document format and included several sections:

- the project summary and expected results, including the project rationale, including the context in which the team's solution is expected to work, the relationship of the project concept to MIL, and the argumentation for project's financial support.
- an implementation strategy including including the target countries, audiences, and time period chosen for the project; and specifying the planned actions and tangible deliverables for achieving the larger effects in the segment of society.
- a list of key players that are going to be involved in implementation of the project as well as the parties that are going to benefit in the short- and long-term of the project; a tentative development and implementation budget and the contact details of the team leader and/or the person responsible for communication with UNESCO and the facilitators on behalf of the team.

The purpose of using the Concept Note assignment for this research study is to assess the level of teams' understanding of MIL and of its potential to be applied to social problems, teams' creative talent in developing new products and services and team's ethical stand as digital citizens on the issues of the media in society.

Qualitative Interviews

Among the existing forms of qualitative interviews used in action research I have chosen to undertake semi-structured interviews. Thomas (2013) writes that this kind of interview provides the best fro both the researcher and the interviewee, combining the structure of a list of issues to be covered together with the freedom to follow up points as necessary. Thomas suggests to have a list of topics to discuss doing the interview instead of writing the questions in full. My list of topics for the interviews covered mainly three areas: understanding of MIL concept, teamwork process, and the design framework of the hackathon. The interviews included questions for participants self-reflection in regard to understanding and perception of MIL, their rights and capabilities as digital citizens and the power they have to impact current issues. Interviews also gave chance for participants to share their criticism of the hackathon and the programme which was also very important for the study. In total, I have managed to take three individual interviews organised as online audio calls via Google hangouts that lasted between 17 and 36 minutes and afterwards were transcribed into ten pages of digital text.

Online Feedback Surveys

I used online feedback surveys in order to find out the levels of engagement individual participants experienced throughout the hackathon and the programme and analyse the feedback they gave on their own understanding of the purpose and the influence of the hackathon and the programme.

According to Thomas (2013), the defining characteristic of a questionnaire is that it is written form of questioning. Questionnaire is flexible is form - it can be very structured and at the same time also allow the opportunity for a more open and discursive response if required. Thus, questionnaire is considered to be a versatile tool used in a number of different kinds of research design. Thomas suggest the following guidance for constructing questionnaires: keeping everything short, being clear about what is being asked, being precise, collecting all the necessary information, and being aware of prestige bias, meaning understanding that respondents might want to look clever/nice/rich/etc. My questionnaires both for the hackathon and for the programme feedback were under 18 questions and were organised in several different ways: dichotomous questions, multiple-choice and matrix questions, rank order questions, scales - the Linkert scale and the semantic differential scale.

Overall, I managed to gather 24 and 16 individual responses for the hackathon feedback and programme questionnaires respectively.

Research Diary

Among the research methods, reasearch diary is considered to be one of the most common and useful (Altrichter et al., 1993). Easy in organisation and effective for data collection, it reflects the way the research and personal ideas of the researcher develop.

Thomas (2013) lists three types that research diaries are divided into: interval-contingent, signal-contingent and event-contingent. My type of diary is a mix signal and event types, as I took notes after each scheduled session with a team, but also sometimes after additional calls or email / chat conversations when I thought that I was receiving a new signal that would be important for the study.

Altrichter et al. (1993) suggest keeping the diary personal and private, written regularly and soon after carried action, each entry marked by the date of the event and the context and organised in the most convenient way for the researcher. He also says that self-censorship in writing the diary is unnecessary. During the course of the hackathon and the programme, I had been completing the research diary, following the aforementioned suggestions. I made entries to the shared Google Sheet next to each team's row as I was contacting the teams and additionally wrote down my thoughts and observations after each week of the programme separately in a digital text document. In the Google Sheet I described the progress status of the team, the main tasks the teams has been working on or completed and the obstacles they have faced on the way. In my own separate diary I took notes of my facilitation style and the way I understood the teams' perception of my individual calls with them, the tasks and documents we were working on. In conclusion I usually wrote what I thought would be the next steps to take in the work process. Overall, my research diary is 5 pages long, typed in Helvetica Neue font with size 11,5.

3.1.5 Reflecting Stages 1 and 2: Thematic Analysis of the Data

Thematic analysis, according to Fereday and Muir-Cochrane (2006), is “a form of pattern recognition within the data, where emerging themes become the categories for analysis”. It relates to what Thomas (2013) writes in his book about the constant comparative method: “from the constant comparison you mark your data up with codes - abbreviations, names, marked and/or colours that describe its important facets. You eventually emerge with themes or categories which capture or summarise the contents of your data.” Braun and Clarke (2006) define **themes** as capturing something important about the data in relation to the research question, and representing some level of patterned response or meaning within the data set. They also lay out the steps for undertaking thematic analysis starting from familiarising with the data, initial codes generation, identification, definition and naming of the themes, and finally, report production.

I chose to use thematic analysis to analyse the data gathered through the Concept Notes, qualitative interviews, feedback surveys and my research diary. I looked for patterns in the answers I managed to gather and organised them in a table which attempts to show the main themes accompanied with the quotes from the participants. For example, I looked for clues such as **better understanding of MIL discipline and its importance** and **critical thinking**. The topics and the quotes I organised in the template Table 1 below:

Topics	Learning Outcomes	Taking action on MIL promotion and education	Challenges	Overal Opinion of the Hackathon and the Programme
Quotes				
Themes				

Table 1. Thematic Analysis of Feedback Surveys: Outline.

Table 2 below shows the example to illustrate how this method was used in analysing the feedback surveys:

Topics	Learning Outcomes

Quotes	*"The project has helped me to understand the main competences and skills that people who know about information literacy have and, in this way, define focus groups to teach literacy to parents in the communities of Havana." [Participant 15, Cuba]* *"It made me to realise that there are so many people in my community who still do not understand the role media and information play in driving Sustainable Development. I can decode information and make decisions based on them but many people can't." [Participant 7, Nigeria]* *"At first my understanding to MIL change completely. I thought the MIL based only in the education meaning, like the right of education. But then I realised it is also reducing the risk of a 'lost generation' for the children. So not only [it fosters] education but also reduction of child labor and early marriages…" [Participant 9, Palestine]* *"The world is experiencing very rapid changes in which technology is often the protagonist. Understanding its operation and how to apprehend them for all spheres of life is vital." [Participant 13, Cuba]*
Themes	Building domain knowledge and transforming one's perceptions of MIL concept

Table 2. Thematic Analysis of Feedback Surveys: Example.

In Table 2 I list four quotes from different feedback surveys in Quotes row. These four quotes present the impact the hackathon and the programme had on students' understanding of MIL. One respondent states that the hackathon experience helped his/her understand MIL at a competence level, another one realises the difference in her level of MIL competence and understanding of its importance from the others in her community, third participant transforms her perception of MIL concept completely, and the last one concludes her leanings in a clear directive message. As a summary for this category, the Themes row states that building domain knowledge and transforming one's perceptions of MIL concept was one of the learning outcomes.

Conclusion

The study of Global MIL Youth Hackathon Programme was designed and performed by using action research method. As a researcher and an organiser and manager of the hackathon and programme experience, I took active part in each and every stage of the working process. Over the course of both events participants completed several tasks, one of which (the Concept Note task)

had been chosen for thematic analysis in this study along with the other planned data collection methods - qualitative interviews, online questionnaires and my personal research diary. The next chapter of this paper continues with findings made from the analysis of the gathered data.

4 RESULTS

The outcomes of the Global MIL Youth Online Hackathon and its 4-Week Followup Programme can be assessed from different perspectives: project outcomes and academic (research study) outcomes. Importantly, that in this kind of practice-based study the project and academic results are intertwined with each other.

In **project outcomes**, the following subchapter 4.1 presents the results of the hackathon teams' work for the reader's better understanding of the nature of the projects, and gives evidence on how the hackathon met the three initial objectives listed earlier in the Chapter 3.2 Designing The Experience And The Study, page 26. The nature of the project outcomes is both:

- societal, in the sense that they (a) resulted in conceptual projects for audience-oriented products and services, that have potential to influence the (b) presented societal challenges related to MIL;
- and economical, for example, such as amount of the awarded YSI funding. This project outcome has been presented in the form of the eight final concept notes.

The **academic outcomes** represent the intercultural outcomes of GlobalMILHack and show the links between maker culture and MIL. Subchapter 4.2 presents the skills and knowledge that have been developed throughout the hackathon as pedagogical practice. These have been assessed through thematic analysis of the concept notes, surveys, interviews and research diary. Finally, the project and academic outcomes are linked together in the Discussion Chapter in mapping the results.

This chapter presents quotes from the different data sources - interviews, surveys, concept notes and research diary. The quotes are referenced with the title of the data source, number of the participant and his/her home country (e.g.: Survey, Participant 15, Cuba). In case is the quote of the participant has been recorded in the research diary, the reference adds the event name and part, and the date of the diary entry (e.g.: Diary, Programme Week 1, 19.11, Participant 2, Morocco). All quotes are presented with the original spelling.

4.1. Project and Academic Outcomes of the GlobalMILHack

The hackathon objectives restated below were to promote media and information literacy and to engage international audiences in a shared collaborative activity that is aimed at long-term results. The design method of the hackathon aimed at:

1. creating new services and tools for MIL promotion and education (practical aim of the study),
2. building the domain knowledge around MIL (an educational aim of the study) through doing a research on the current situation around one of the five given hackathon challenges, and
3. creating an opportunity for remote participants to exchange opinions and ideas across boarders for gaining transcultural understanding of current issues around MIL (a transformative aim of the study).

4.1.1 Societal outcomes of the final projects: creating new services and tools for MIL

The first objective was fulfilled by the successful result of the eight produced concept notes along with visual presentations and prototypes. These projects constitute promotion of MIL and imply various educational activities to be carried out with the implementation. These projects included digital services and platforms that were focused on promoting MIL to different audiences across the globe:

1) Small Refugee (team of 6 from Cameroon, Senegal, Nigeria, Palestine, Mali, Ethiopia) - a digital platform that provides multimedia learning resources and online assistance to help refugee children complete their school studies in their native language. At the same time, the platform aims to provide psychological support and grow community spirit through peer-to-peer learning and highlighting the success stories to motivate students to study and achieve their fullest potential. Focus: Current Syrian refugee children (6-12 years old) living in Turkey and in the longer term - Native Arabic speaking refugee children from Syria, Palestine, Iraq, Iran, and Somalia.
2) Gender Conversation: Ending Conflict That Arises From Gender Conversation Via The Internet (team of 3 from Nigeria) - a project that centres around providing safe space for gender conversation and rights of women as humans, it advocates gender equality, freedom of speech, mutual respect as basic proof of human decency and aims to create an online space and offline

event where women and men talk freely about gender, social role, stereotypes, etc, without disrespecting, bullying or being disrespected or bullied. It does these essentially focusing on and exploring sexism in online conversations; how women are depicted in media/online content, how to detect sexist content, how to respond to sexist content on social media. Primary focus: Nigeria.

3) Family 2.0 (team of 4 from Cuba) - a community project that aims to influence the way in which children and adolescents (between 6-15 years) use electronic devices and media for their education and learning throughout their lives. This project highlights the role of parents as the main educators of their children and responsible for teaching them the appropriate uses of both information throughout electronic devices and media. Focus: Cuban families with children up to 6 years old and/or adolescence between 6 and 15 y.o.
4) MIL Organisation for Peace (team of 2 from Morocco and Sierra Leone) - an organisation with the central mission of legally advocating against human rights violations in the Media. In the meantime, raising awareness through campaigns and also developing educational Materials for MIL. The results expected are to lessen the number of people who are victims of Rights violations (especially young women) in Media and Information channels, promote global peace by educating people how to analyse and decode information received, and create a global interest about the importance of MIL to the world peace.
5) Pengo Serious Game (team of 8 from Palestine) - a game is aimed at building a society that respects the cultures of others. This is a concept of a multi-player game that allows the players to go on missions and perform series of tasks that involve critical thinking, team learning and information gathering and processing. Focus: International youth 10-16 years old.
6) Fake News Combat (team of 4 from Côte d'Ivoire) - a project consisting of production and dissemination of MIL content via the social media platforms (Snapchat, Instagram and WhatsApp) to young internet users in Côte d'Ivoire aimed at helping them detect fake news and avoid sharing them.
7) Be Kid app (team of 5 from Palestine) - an app that offers children a safe space in media by streaming them content recommended to and approved by their parent(s) and is suitable to child's age and needs, as well as integrating educational content for parents and children on how to use media wisely. Focus: Families with children 6-10 years old in Gaza, Palestine.

8) MIL Awareness Champions (team of 5 from Nigeria) - a social project that aims to raise Media and Information Literacy (MIL) champions among the Nigerian youth, who will educate children in their local communities about MIL. The project aims to create a website whereby basic and advanced knowledge on MIL would be learned and evaluated. The final goal is for the children to build the capacity to verify information online and access not harmful educational content.

After the extended period of judging, the results have been announced to the five selected teams that were approved for receiving project funding from the YSI. The final budgets ranged from 5,000 euros to 13,000 euros per project and were restricted for completing the planned activities by the end of 2019. Synopses of the eight final projects that participated in the 4-week Programme are available on the official website of the Global Media and Information Literacy Online Youth Hackathon: www.globalmilhack.com

4.1.2 Intercultural Learning Outcomes of GlobalMILHack

Creating an opportunity for remote participants to exchange opinions and ideas across boarders for gaining transcultural understanding of current issues around MIL appeared to become the most influencing factor on the impression that GlobalMILHack gave to the participants. Many of them have repeatedly expressed their appreciation of the event's design that allowed them to make personal contribution to the lives of the others:

> *It is an opportunity to contribute something to Cuban society. With our project, we can contribute to a better development of children in our country. [Survey, Participant 14, Cuba]*
>
> *I would say it's a great opportunity to learn and to help improve something in society and to be more useful for the community. [Survey, Participant 12, Côte d'Ivoire]*
>
> *If any one want to help the other and want to change or solve any humanity problem, he should do his best and join this Hackathon. [Survey, Participant 9, Palestine]*

Building collaborative, inter-cultural skills

The hackathon aim at creating new services and tools for MIL promotion and education stimulated building collaborative, inter-cultural skills though co-design of solutions and co-construction of team knowledge around the existing state of the issue:

> *Gender has always been a passion for me, so when I met my teammates and we started sharing ideas, I pitched mine and the team found it most relevant because everyone could relate to that and found it important. They've supported me - each one in own way - and we managed to get diverse views on the subject of gender dialogue in media. [Interview, Participant 4, Nigeria]*
>
> *It helped me to learn from others and to give also my experiences. [Participant 6, Mali]*
>
> *The program helped me to work in a team using the information and communication technologies. It also contributed to deepen my knowledge about information literacy in general, and to build activities to help parents improve their skills in the use of such technologies.[Participant 15, Cuba]*

One participant has also highlighted the method that he found useful in working on the project:

> *It was an opportunity to work with diverse people and learn from the process. One key thing that worked for me was the power of storytelling in designing a project! [Survey, Participant 3, Nigeria]*

Few reflections actually showed evidence of openness to cultural differences between the team members and their understanding of its importance when discussing common societal issues. Participants were exited and curious to engage with other people and their perspectives on the world.

> *Today was epic! When do we ever get to talk with people around the world and get feedback from internaitonal organizations? [Diary, Programme Week 1, 19.11, Participant 2, Morocco]*
>
> *Communication with other people in the world it is so useful to have experience . [Survey, Participant 8, Palestine]*

My data also shows that some participants had a transforming experience:

> *The program help me to know more people from different countries and that change my thinking about different countries and cultures. [Survey, Participant 9, Palestine]*

While others acknowledged the learning element of cross-cultural collaboration:

> *This program is one that builds up any individual. Since most of us were teamed up with people from different backgrounds and culture, I believe that this project helps one learn how to deal or relate with people from a different cultures .I helps us grow and also help us learn new things. [Survey, Participant 3, Nigeria]*

> *They [hackathon participants] should deal with their team: call them, motivate them, lovely words and keep in contact with your team. That will be their key to reach [results]. [Participant 9, Palestine]*

Building flexibility and adaptability through experiencing adhocism

The process if creating solutions, as mentioned in the Design of the Hackathon and Programme Experience, is very iterative, with many ad-hoc tasks and issues to address, and therefore demands the teams to be flexible and adaptable. Since the both events were designed to give autonomy to the teams and the majority of the participants have never been to hackathons before, teams faced ambiguity, and had to adapt and take constructive decisions towards it, in other words, show tolerance to ambiguity:

> *My time on HACKATHON was very rewarding, I learnt a lot given the short duration, the highlight of it was been able to brainstorm on an idea, through implementation and it's sustainability. I had had to read through the entire project over the weekend to have it become a part of me. [Survey, Participant 8, Palestine]*

Other participants mention the difficulties they experienced with their team and how they managed to overcome those:

> *In my team, we are from different countries at first so difficult to communicate but finally we be as one man we work together and divide the tasks. [Participant 9, Palestine]*

> *The skill that I got to be Patience on your team.[Survey,Participant 16, Palestine]*

> *Communication with teammates was challenging, - we are all working, and our schedules are different, they're are technical issues in communication. [Participant 4, Nigeria]*

> *To be ready to work hard because it's not so easy and helps to discovery so many things. [Participant 6, Mali]*

One of my research diary entires particularly represents the adhoc moment the team went though:

> *Today the team reflected on their first pivot that they have to do due to the feedback they've collected on their initial idea from the perspective target audience. They went to kindergarten, where were told that it is not legal to make apps for this age and it won't be useful, realised that the idea was too complicated for the target audience. Children should not use smartphones. So they changed the focus to a different age group - 6-10 years old. Tuesday they will upload the files. They seemed to be not confused, not disappointed, but rather enlightened by the fact that they've come closer to finding the truth - the working solution. [Diary, Programme Week 2, 25.11]*

Building self-regulation through autonomous learning and reflection

Being flexible and adaptable as a team cannot be achieved without the individual team members being able to self-regulate, learn and perform autonomously:

> *Prepare to own a project as much as you prepare to work with a team. Everyone should take it as a personal project. As much as they are going to be in groups and as much as I believe in teamwork, I think there is always a need for somebody to own the project. So i think the participants should just go in and take it as their own/ make it their personal thing and let their passion to carry them on. [Survey, Participant 4, Nigeria]*

Self-development came as an integral part of the individual experience of the participants:

> *I also developed my leadership skills and working to complement my team mates. Also learning to carry team along about the progress of our project. It was a great privilege to lead even without being told. I also gained more insight into the relevance of Media, Information and Literacy in our world today. It was am eye opener! [Survey, Participant 7, Nigeria]*

> *Development of skills in the creation of projects. Analysis and synthesis of information. Strategic work and communication development. Great teamwork. Changed the perspective of the contents used in the realization of the project. Put into practice the knowledge acquired in the university. [Participant 5, Cuba]*

> *Talking is one thing, but imagine talking to many people in different timezones - that's very different! It's a lot of work! [Interview, Participant 4, Nigeria]*

Building media literacy skills through critical understanding of issues

It has been already mentioned in the previous section that the participants built knowledge around MIL and its influence of the lives of the people from different social, cultural and economical backgrounds. Here is more evidence to support this learning outcome:

> *It made me to realize that there are so many people in my community who still do not understand the role media and information play in driving Sustainable Development. I can decode information and make decisions based on them but many people can't. [Participant 7, Nigeria]*

> *The project has helped me to understand the main competences and skills that people who know about information literacy have and, in this way, define focus groups to teach literacy to parents in the communities of Havana. [Participant 15, Cuba]*

Here is also evidence from this very representative quote from a participant from Nigeria on the MIL mindset:

> *This project has affirmed my opinion that while we exercise right to freedom of speech, it is important to be true, civil and courteous. [Survey, Participant 4, Nigeria]*

While ones reflected on the more holistic understanding of MIL, others emphasis their learnings of new media and communication tools and techniques:

> *With this project I learnt some basic things on Microsoft ,and IT in general. [Participant 3, Nigeria].*

> *Communication skills, How to introduce the idea, and this is the first time to me to be on a competition online and it was very good. [Participant 8, Palestine]*

Though building literacy skills, the participants viewed the hackathon experience as giving them competitive advantage for the future professional work:

> *This experience gave us a lot to face the work environment. We reinforce a lot of relevant skills to perform as information professionals. I would recommend this experience because it broadens the knowledge and perspectives on media and informational literacy, knowledge that can improve the way of projection of any professional and of the citizens in general. [Participant 13, Cuba]*

Also, the participants mentioned building the soft skills, like empathy, which is considered a requirement to the understanding and relation to the thoughts, beliefs and feelings of others:

> *It also tried to mix the people with the refugees - I mean not only help them but also merge them with the society. I am a refugee and understand what the refugees suffering from. [Participant 9, Palestine]*

Building creativity through problem-solving and design

Few of the participants particularly noted how the design of the hackathon and programme experience has helped them learn:

> *It is a program that helps you organize a desired project and supports you in each of the tasks, in addition the collaborators support you in the concerns that you present throughout the program. The program brings you knowledge because you must constantly research the topics in which you develop the project. Finally, this program provides skills in the elaboration of projects and to work in groups using information and communication technologies. [Participant 15, Cuba]*

Validation step of the learning journey that happened in the "Ideation" and "Prototypes" stages of the hackathon have particularly influenced the hands-on learning of the participants. User- or customer-oriented approach that the design studies promote shows in the team learnings:

> *We understand that it is important to work closely with the users. By the end of the first 4 months of our Project, we plan to evaluate the response from these kids [50-100 children] to see where our service can be improved. By doing this we will adapt and develop our mobile app, and also the information disseminated to these kids. When this is achieved ,we could then increase the amount of kids we have on our platform. [Team MI1 Concept Note]*

Skills of listening and observing, noticing and understanding what is being said and how it is being said has been noted as well:

> *They [future participants] should live the people problems and touch it to solve it before they add any solution. They must listen to the people who they will solve problems for. They need to read a lot. If anyone wants to help the other and wants to change or solve any humanity problem, he should do his best and join this Hackathon. [Participant 9, Palestine]*

Building global citizenship as a sense of belonging to a broader community

One of the most important settings of the hackathon and the programme was that the participants would be exposed to a multi-cultural environment, where they would be encouraged to take action. This had a positive influence on their perception of the world around them as well as themselves in the world:

> *I liked knowing that despite being so far geographically there are people focused on making projects that contribute to a better world through the correct use of technologies. [Survey, Participant 14, Cuba]*

Before the commencement of this program, I didn't really understand the situation of refugees in the world .With the help of my team mates and the project we worked on , I can beat my chest that my view about life in general has changed. I now understand that the little help we render can change many lives. [Participant 3, Nigeria]

Encouraging participation and empowerment

Feedback showed that participants have built a positive belief in their own ability to undertake the actions in order to achieve particular goals and make a difference in the world. They noted that collaborative effort is equally important:

It made me understand that the world could be a better place if we get to do the right thing. The programme also opened my eyes to see problems affecting my society and how to get solutions to solve them. [Survey, Participant 17, Nigeria]

This program lead me to the understanding that you can take up venture to achieved something through online with different people from different backgrounds. [Survey, Participant 11, Sierra Leone]

There are no barriers that can not be overcome. In our context, I think about language and distance. [Participant 10, Côte d'Ivoire]

Hackathon has also improved participants' understanding of personal interests and abilities:

This programme helps me understand how important passion/interest is in what we do. If the project wasn't of great interest to me, I wouldn't have been as dedicated as I was. [Participant 4, Nigeria]

That I was also able to combine this project with my job and volunteering commitment successfully tells me that I can handle more than I currently am. It helped me see that maybe I can do more that i thought i can be doing. [Participant 4, Nigeria]

Building the citizenship values

Finally, it should be noted that on the general level the values of a informed, engaged and empowered citizen have been formed throughout the hackathon experience, as the extracts from the Concept Notes show below. Teams have been asked to give rationale for their project concepts and the following two examples show the level of their thinking:

Sustainable development goals can't be achieved if human rights are violated and compromised, conflicts exist, young people and women are not aware of their rights and how to protect themselves, laws are not protecting the human dignity

> *and the freedom in media. Therefore we believe that our efforts should focus on three levels that work all together in synergy as proposed in the following project : Disinformation Law Clinic (DLC) - an online organisation that will (1) offer counsel and advocacy in courts to help victims of human rights violations caused by disinformation to navigate through their local legal systems; (2) engage in lobbying of reforming the laws in cases where Local Laws come short to protect the citizens' rights. In addition to the DLC, we are going to raise awareness through workshops and similar activities as well as develop online educational materials around disinformation and human rights protection in media. [Team DI4 Concept Note]*

> *The project centers around providing safe space for gender conversation and rights of women as humans, it advocates gender equality, freedom of speech, mutual respect as basic proof of human decency and we expect to create an online space and offline event where women and men talk freely about gender, social role, stereotypes, etc, without disrespecting, bullying or being disrespected or bullied. It does these essentially focusing on and exploring sexism in online conversations; how women are depicted in media/online content, how to detect sexist content, how to respond to sexist content on social media. [Team DIA2 Concept Note]*

4.1.3 Learning Outcomes: Building the domain knowledge around MIL

Building the domain knowledge around MIL was managed through the collaborative problem-based learning approach, implemented in the first stage of the Double Diamond Design Model (described in section 3.2.2), in which the participant had to independently research the current situation around their teams' hackathon challenge, share his/her findings along with personal opinions and experiences with their team members, discuss and collectively choose the particular problem and context they would focus on. The interview results have shown that the participants had numerous remarks about the relevance of the hackathon themes to their previous studies:

> *The experience was really positive and interesting. We were able to enrich the concepts received in our subject of Information Literacy. [Participant 13, Cuba]*

> *The event seemed very relevant to me since it helped me to reinforce the knowledge acquired in the subject of Information Literacy received in the 5th year of Information Sciences. [Participant 16, Palestine]*

Participants commented on improved understanding of the role MIL plays in real world:

I discovered the atrocities that can result from the Disinformation. [Participant 2, Morocco]

It made me to realize that there are so many people in my community who still do not understand the role media and information play in driving Sustainable Development. I can decode information and make decisions based on them but many people can't. [Participant 7, Nigeria]

The world is experiencing very rapid changes in which technology is often the protagonist. Understanding its operation and how to apprehend them for all spheres of life is vital. [Participant 13, Cuba]

Digital literacy is only a part of MIL, in my opinion. Limiting it only to DL is robbing it of all things it is capable of, I personally think that our project is going to leverage digital, it is not only about DL .[Participant 4, Nigeria]

There were participants, who largely changed their perception of the concept:

My understanding to MIL change completely. I thought the MIL based only in the education meaning, like the right of education. But then I know it also reducing the risk of a 'lost generation' for the children, improve their skills whatever is it, so not only education but also reduce child labor and early marriages, provide the education with fun and creative way not normal and usual style. [Participant 9, Palestine]

Now as the GlobalMILHack outcomes have been covered, it is time to have a closer look at what did the learning outcomes translated into in relation to MIL and maker culture, according to the gathered feedback from the participants.

5 DISCUSSION

This chapter first looks at how the hackathon design method meets the criteria for a good educational practice; then continues with discussion of what did GlobalMILHack results mean in relation to the theoretical framework and answers the sub-questions of this study on the learning outcomes and their relation to active citizenship; and finally, concludes with the answer to the main research question by listing the elements that hackathon can bring from the maker culture into the MIL practice.

This study uses the seven-points framework, provided by Richardson and Milovidov (2016) for assessing the online hackathon method as an educational practice. Same framework, defined by the European Council, was used for discussing good practices in "Digital Citizenship Education, Volume 1: Overview and new perspectives" publication by Frau-Meigs et al. (European Council, 2017, pp. 34-35).

Here is how the hackathon design method meets each of the 7 criteria for a good educational practice. Criterion 1 of having a positive impact on individuals and/or communities is met by an online hackathon influencing the participants and the communities they come from as it reaches out to both urban and remote areas and encourages the participants to form around common problems they see in their own local contexts. As the projects develop, the teams enrich their understanding of the local issues and the ways to diminish them. As an outcome, the teams present action plans ready as well as their own involvement as a human resource for the implementation. Online hackathon meets the second criterion ("has been proven through implementation to be effective in realising a specific objective") as, first, is proven through actual implementation in the case of GlobalMILHack and the Programme, and, second, proves to be effective in realising the three set objectives: (1) creating new services and tools for MIL promotion and education, building the domain knowledge around MIL through doing a research on the current situation around one of the five given hackathon challenges, and building digital

citizenship among the participants through the hands-on approach to learning and co-creation. Third criterion of reproductivity and is adaptability of the practice to different contexts is met by, firstly, the evidence of multiple hackathons that are taking place today in various industries, and secondly in the case of the online hackathons in particular, by the adaptable online digital format of the event that allows any educator or practitioner that has a stable internet connection to adopt the practice and organise a hackathon. The forth criterion of "responding to current and future needs of the target population" is met due to the two factors: the themed nature and the infrastructure of the experience: themes (or the challenges) that participants are presented with are hot and arguable contemporary topics for the audience, they stimulate discussion and are relevant to local and global contexts at the same time. Secondly, the infrastructure of the hackathon - meaning the same digital format - responds to the current needs of the participants, that sometimes consider themselves isolated from the opportunity to change the situation they live in. It allows them to take action irrespectively of their social status, location, religion, age, gender or race. The fifth criterion for the practice to be technically, economically and socially feasible and sustainable is met by the fact that neither the hackathon, not the programme requires extensive resources from the organiser(s): the most needed resources for this type of activity is time and internet connection. All the digital tools and software that were used in the case of GlobalMILHack were free of charge and did not require any special knowledge or expertise to use. Thus, the coordination of the learning process can be managed by a person who is familiar with the basic online and offline technical tools for internet browsing, online voice and email communication, and document editing. The sixth criterion demands from a practice to contribute to "an inclusive society, adaptable for individuals with special educational needs". In case of GlobalMILHack participants did not have any special needs that would require me to change the framework of the learning experience in any way other than, sometimes, explaining the difficult concepts in English. However, if there would be someone among the participants with, for example, visual impairment, I, as an educator, would be able to provide that person with the software that would allow to read aloud the texts teams were working on. Because of the digital nature of the experience, the hackathon learning process can be optimised to the needs of the participants. Finally the seventh and the last requirement for the educational practice to be "a participative process that is able to generate a feeling of ownership in those involved" is sustained by the multiple pieces of evidence presented in the quotes earlier in this paper, which tell that the

participants indeed felt empowered to make the change happen and that they were proud to take ownership and responsibility for the ideas they proposed. Here, an objective conclusion would be to say that the suggested online hackathon method sustains most of the requirements for the educational practice and therefore, could be considered as such.

I believe that the online hackathon method shall see light in practice of other educators across the globe and involve many more young people and multiple stakeholders in collaborative creation of validated feasible solutions to the contemporary issues in the world. This study has shown how the method performed in the context of multi-cultural youth participants aged between 25 and 35, including students and young professionals, and thus is giving validated evidence of a successful practice for practitioners in higher education to implement in their work in the years to come. The value that such method can bring shall go beyond literacy aspects and involve more domain knowledge in other industries in order to help the global society on the way to achieving sustainable development goals. I hope that this collaborative approach will be taken forward by the educators and supported by the multiple stakeholders in the field.

5.1. Results on Maker culture

5.1.1 Learning Outcomes in Relationship to Maker Scenarios

The Double-Diamond Design Model (Design Council, 2008) represents a maker scenario used in GlobalMILHack and the followup programme. This section now will outline the main stages of the Model and provide the corresponding tasks that the hackathon participants had to go through.

Research	Divergent thinking: think about your team's challenge theme and via a social channel of your choice exchange thoughts with your team, share opinions and experiences, look for more data on the theme, collect and sort the information. The aim is to gain a transcultural understanding of the problem on a bigger scale.
Insights	Converging thinking: narrow down to very specific problems that includes a local-level perspective of the problem. Decide on the particular audience and its pain point which you are going to address in your project. Fill-in Google form to give your own team interpretation of the challenge from the bigger perspective and explain which specific problem in particular and on which level are you attempting to solve.

Ideation	Divergent thinking: generate as many ideas for the problem solution as possible. Set your creative minds free and try to arrive to unexpected, out-of-the-box creative ideas. One rule to obey is at this stage to accept and record all the ideas with no exception or criticism. Thus, all team members had a chance to speak and express their views.
Prototypes	Converging thinking: choose few of the ideas from the brainstorm stage, validate them by collecting feedback from the targeted audience(s) and visualise them in the form of digital prototypes and presentations. Test your assumptions, be ready to iterate.

Table 3. Mapping the 4 stages of learning tasks.

The table showcases the four stages of collaborative learning activities adopted from the DD Model. Judging by students' learning outcomes presented earlier, these learning activities proved to be beneficial for participants, since they have engaged them in cross-cultural knowledge and opinion exchange, co-creation of new knowledge and co-producing new content (the prototypes, social media posts and concept notes). These activities follow the constructivist theory of learning (Piaget 1970, Vygotsky 1978), in the manner of learner-centricity and enabling collective knowledge creation though teamwork. In this scenario, my role as the hackathon facilitator was not to transmit knowledge to the participants, but as Piaget writes, be rather a cognitive guide - I posed questions leading participants' thinking in the certain direction. Thus, many of them, as noted earlier, found the experience to be very different from what they were used to at their own universities and felt more responsible for their ideas and decisions.

Having people participating online, made it a virtual learning environment, which fostered social learning process (Vygotsky 1978) as it happened in teams. Virtual environment created during GlobalMILHack can be called an affinity space (Gee, 2004) and referred to the informal learning environment (Jenkins, 2006) as it happened outside of any particular educational institution. Therefore, according to what the authors have said about the relationship of affinity spaces and informal learning environments to skills development, this current study results of building creativity through problem-solving and design hold true.

As for building flexibility and adaptability through experiencing adhocism, the evidence has shown that the participants have been put under pressure of time and scared resources, so they had to find the most effective way to iterate their ideas. Flexibility and adaptability as well as building self-regulation through autonomous learning and reflection, discussed by Taylor (2016), viewed as the important 21st century skills here, make the important part of the learning.

5.2. Results on MIL

5.2.1 Learning Outcomes Relationship to MIL

To start the discussion on how the results of the study reflect the MIL side of the theoretical framework, it is better to first take a look at the chronological order, in which the four stages of the hackathon design model (Research, Insights, Ideation, Prototypes - see Table 3 above) followed the four major points for understanding media literacy, presented by Livingstone (2004) - access, analysis, evaluation and content creation. Participants accessed, collected and sorted out the data on the challenge theme in the first stage, analysed it for deeper understanding on the issue in the second stage, evaluated the causes of the problem, the groups affected by it and the possible ways of influencing the problem - in the third stage, and finally created new content for showcasing their work and emphasising their opinions and ideas.

Visual presentations in MP4 format as well as in written form of Concept Notes allowed participants to minimise the language-related issues with using diverse visual examples. Teamwork allowed the participants get familiar and establish mutual connections. This mutual connection, mentioned in numerous participants' quotes under "building collaborative, inter-cultural skills", established the intercultural dialogue that was discussed earlier in relation to participation in media (Pathak-Shelat, et al. 2015, Jenkins 2006). Different cultural perspectives on the same uniting issues came to show the participants the similarities of their social contexts regardless of historical or geographical background, which in turn was transformative for many, as the results have shown.

The results pointed towards building media literacy skills through critical understanding of issues that the participants were grouped around. Through working with data that the participants gathered online from diverse sources, they practiced their critical thinking and reflected on the

diverse ways in which they culturally perceive the information. This way, they participated in constructive knowledge creation (Piaget 1970, Vygotsky 1978) on the MIL issues and themes, as they have brought in personal perspectives on their experiences with media and information. They then utilised their knowledge to create meaningful solutions to the critical problems in focus, therefore have participated online in collaborative problem-solving (Jenkins 2006), and practiced their participatory media literacy, as defined earlier by Rheingold (2008) as giving a "response to the possibility that today's young people could have a say in shaping part of the world they will live in".

Looking at Rheingold's (2008) definition and characteristics of participatory media, it occurs that the hackathon has managed to address all of them in a way, as it was (1) many-to-many where each participant had a chance to express his/herself through many kinds of media content (picture, photo, video, text, tags, discussions) - technical-structural characteristic; (2) provided for active interaction of the participants between each other by setting the format of group work — psychological and social characteristic; and finally (3) created a social network, amplified by the online channels that were used (Google Hangout calls, Facebook page / chats / calls, email), that enabled broader, faster and lower cost of coordination of activities - economic and political characteristic (Rheingold 2008).

5.2.2 Learning Outcomes Relationship to Citizenship

Letting the participants form teams around the challenges that were mostly interesting to the them was another important aspect to consider in relation to the interest-driven approach in learner-centred pedagogy and the significance of real-life participation in relation to learning experiences (Smith et al, 2005). This had direct influence on how the participants felt empowered and encouraged to participate.

The results given under "Building global citizenship as a sense of belonging to a broader community" have proven what was discussed regarding "voices" by Rheingold (2008), might have indeed helped connect self-expression with civic participation. It is inspiring to witness that the participants saw themselves as change makers or at least the ones who have got a chance someday to improve their own local realities. They mentioned that they were not alone, that they felt as together they could have bigger impact on the problems at hand. This signals about their

construction of citizenship values, discussed in Chapter 2 in quotes from UNESCO and OECD, and about ability to understand the influence of their actions an decision on the local and global contexts.

So did the teams of GlobalMILHack participants actually become the proto-publics for longer-term change? Going back on the definition given to proto-publics in Chapter 2, we can see that indeed the teams were comprised of people with multi-disciplinary and multi-cultural backgrounds concerned and united by a particular issue. Thought the stages of hackathon design process they found the way to arrange and align their different skills, capacities, interests, material resources, and activities toward achieving the shared goad, towards articulating and addressing issues in future endeavors. The hackathon teams, as proto-publics, therefore serve as test sites to understand the character of participating with regards to a particular circumstance or issue.

5.3 Mapping the main results: From Maker Culture to MIL Pedagogical Practice

Through these elements below this study brings the answer to the main research question which is how to bring maker culture into MIL educational practice through an online hackathon?

Element #1: hackathon, an affinity space, makes learning multi-cultural and opens opportunity for equal participation. The environment of an international hackathon presents the participants with the common endeavours which bridge across differences in age, class, race, gender, and educational level. Participants engage in various ways according to their skills and interests, because they depend on each other in their journey to the final reward. Hackathon allows each participant to feel like an expert and share their skills, while at the same time learning from other. In an international setting, as in GlobalMILHack, it created an environment for an intercultural dialogue. The combination of several digital media channels used for communication with the remote teams enabled the event to reach and engage the audiences that are often isolated from active international participation. These tools included email for making important announcements, Facebook messenger for team chats, Google Hangouts for weekly group calls, and Google Docs for exchange of written materials.

Element #2: hackathon scenario as the sequence of scheduled facilitated collaborative learning activities. The 4-stage scenario (Research, Insights, Ideation, Prototypes), can be used in MIL pedagogical practise to create learning experiences with different timeframes for each stage. While in case of GlobalMILHack the initial plan was to have a 3-day hackathon, the decision was made to extend the experience into a 4-week course. In other settings, this same scenario can be stretched over a longer or shorter periods of time, depending on the facilitator's needs and available resources.

Element #3: adhocism in learning experience. The journey of the participant in a hackathon is non-linear and involves iterations and reconsiderations. Similarly to a hypothesis testing, participants have to use their flexibility and adaptability in order to arrive at the truthful statements and reasoning. On the other side, adhocism shows in the way participants build and test their assumptions - they have to be time-cautious and use the materials and tools at hand in order to build and test their assumptions fast.

Element #4: the competitive element of the hackathon and its emphasis on the real-time problems of the audience. The competitive element provides the hackathon participants with motivation to treat the whole experience seriously, while its application to real life encourages the participants to make substantial commitment to the work. Participants, therefore, experience both intrinsic and extrinsic motivation to show their best, which, in turn, helps them discover and apply their strengths and talents. Collecting evidence for the problem in focus by searching on Internet and talking to the relevant audience is also important for information gathering and educating oneself about the real-life situation of the problem in focus. In this case it is linked to problem- or phenomenon-based learning, where search for theoretical material and information starts with looking a the particular problem or situation in real life. Such approach proves to be beneficial to the student, which can relate and empathise with the problem.

Element #5: constructive non-guided individual and team knowledge creation around the central MIL theme throughout the diverging and converging tasks of the hackathon. Results show that the participants managed to reach a better understanding of MIL and its importance in the society, through finding information about the theme and active exchange of

gathered knowledge and examples with their teammates with no strict guidance from the facilitator. By involving external experts and professionals, hackathon organisers can enrich the learning experience of the students. Mentors, in particular, benefit the teams with their different view of the issue combined with their relevant field experience. Judges, on the other hand, are the ones who decide whether or not the projects should get any reward and, as in case of GlobalMILHack, be funded for implementation.

Element #6: using contemporary media and technology awareness to design new solution to tackle the problems in focus. Ideation stage of the hackathon diverges participants' thinking on what is that they know of (media and technology-wise) can be applied to solve the problem of their chosen target audience. This practice makes them exchange their knowledge and skills in using new media, both enabling and educating themselves to find better, more innovative approaches to the problem. Teams develop analytical and critical thinking regarding the existing solutions and the ones that the team thought during the Ideation stage. Hackathon encourages deep and critical assessment of the solutions in mind, as they have to be original, applicable to and feasible in real life. Teams are also required to look at the existing solutions in the field and see why they are not sufficient to solve the chosen problem. Combination of these two practical tasks facilitates the team to think outside the box and at the same time stay realistic to produce competitive solutions.

6 CONCLUSION

This study has shown that the maker culture can be integrated into MIL educational practice through online hackathon method in different ways: by making the constructive learning happen through problem-focused collaborative adhoc and hands-on approach; by opening up to inter-cultural learning through facilitating the online dialogue; leveraging the critical understanding of media and its role in the society by working on the highlighted social challenges around media use and by creating informed, engaged and empowered porto-publics around the creative solutions.

Based the results, the political conclusions include the inclusive requirements for such practice as hackathon as well as a supporting education policy in place to provide the hackathon participants with the desired experience on local and global levels. While hackathons can work of various scale (local/global), depending on the organiser's preference, the difficulty lays in getting the beneficial (international) partnerships for each case. Moreover, the results of such practice as hackathon are aimed to be fully practical and applicable to the certain targeted situations chosen by the participants, and therefore the policy regarding the hackathon winners should allow for further implementation of the projects in real life with the needed financial and operational support from local and international partners.

As a non-formal educational practice, hackathons have to find a way to become known to the educators of today and tomorrow. This remains unclear as today they are not part of neither MIL, nor regular education practice. The open question, therefore, is how to find a way to introduce it to the field and enable the educators gain the needed connections and resources for such learning experience?

Conceptually, hackathons unite various concepts of maker culture and MIL education, therefore enriching the practice with a fresh and new approach towards learning. Facilitator, following the constructivist notion, becomes the enabler for interest-driven and learning-oriented

knowledge discovery, whereas the learner gains practical insights though the iterative making process. Concepts of media as a tool and as a resource become vivid in this scenario, as they are meant to be presented in any MIL education practice. Access, analysis, evaluation and content creation are all part of the same educational experience and follow the chronological order of the hackathon.

The outcomes of this paper can instigate further research by providing the recommendations for further use of the hackathon method in teaching in student-centred online and offline environments. Additionally, as an option, researchers could continue investigating the method by switching from online to offline hackathons and comparing the results.

The projects that teams proposed in their CNs can and should be viewed in regard of their local media and MIL education policy as they carry arguments about the necessity of introducing those projects on the local level. As for the general MIL policy making, the study will show the positive results of introducing an engaging practice for international audience involvement. This should give good reasons to include such practices in education policy in order to unite and enrich the learning communities around the world.

Although there is still an abundance of things about hackathons to research further, I am confident that that this new educational practice will engage more and more participants globally and will unite them around the vital contemporary issues. Those participants would definitely benefit through active participation and learning more about those issues, exchanging opinions and collaborating with like-minded people from abroad. I think that this approach can serve as a good strategic tool for the organisers to get a broad perspective of the opinions and thoughts around the selected topic, collect fresh ideas for new projects, as well as to find talents that are eager to take part in implementation.

I hope that the results of the study will motivate educators to use hackathon method in digital citizenship and MIL education and, perhaps, other disciplines, too. I hope that the framework will be adopted by the UNESCO for the annual MIL Weeks and by other international and local

organisations. As a researcher and practitioner myself, I would be glad to consult and cooperate on such projects.

As for the innovations, this research study shines some light on the project proposals produced by the teams and I hope that their plan will be successfully realised in the near future. I personally admire the will and the interest participants have put in their initiatives and I hope that the hackathon and the programme were a useful trampoline for them to get started.

The learning outcomes in GlobalMILHack case depict the influence of hackathons on the active citizenship of the participants. Therefore, hackathons can be researched further in the relation to citizenship policies and regulations as ways to foster, encourage and engage the publics.

7 EVALUATION OF THE STUDY

This chapter provides my own evaluation of the current research study. I based this evaluation on the specific measures provided in action research literature (Williamson and Prosser, 2002; Carson et al., 1989; Stringer, 1999). There include ethics considerations described in the first sub-chapter, followed by listing and explaining the challenges and limitations of the study, rigour aspects. The chapter concludes with recommendations of the online hackathon method for other educators.

Overall, there are several advantages of my chosen action research methodology with regards to the research question. One of them is that the designed activity (co-creation of workable solutions to the existing societal challenges) is in its nature a task that stimulates taking active citizenship position towards a problem or an issue. Not only it provokes reflective evaluation of the way one's actions can influence the situation in theory, it facilitates taking planned action towards solving the problem with knowledge and resources at hand. The work process in hackathon and the programme demands high level of involvement in intercultural diverse environment, close social interaction, critical thinking and assessment of own actions and conclusions. This directly makes the involved participants exercise and develop their digital citizenship competences, which were the centre topic of the study. Action research, therefore, was very practical in assessing these competences, observing how they develop thought the course of the study and how the participants reflect on them themselves.

7.1 Ethics

In the action research study such as the current one the aspect of ethics has high importance. The three ethical questions raised in literature regarding action research concern confidentiality, consent, and eliminating harm to participants of research (Williamson and Prosser, 2002).

Considering how close the action study researcher and the study participants work together, confidentiality and anonymity of study participants has to be ensured. For this, as an action researcher myself, I provided written guarantees in the form of the consent forms that the participants filled out before joining the study, where I informed them about keeping the data confidential and anonymous.

The consent given by the participants in its own nature is an important element in undergoing research. An informed consent means that the participants are willing to contribute and support researcher's idea. However, neither researcher, nor participants can influence the results of the action because action research observes specific issue in development. In the case of the current study, participants were informed that I was carrying out the research during the programme by the issued consent form that clearly stated the purposed of the study, the involved parties, and specified that the collected data would be used anonymously. A total of 17 participants signed the consent papers and returned them to me.

Eliminating, or at least limiting harm to participants of research is what the researcher is also responsible for. For this researcher has to find a way to build mutual trust with the participants of the study and be able to freely talk about own ideas with participants. This involved being non-discriminative in the way of involving participants in the research, giving each one an equal opportunity to express his or her opinion, as few action research advocates claim this type of research to be democratic and to be centred around collaboration, where each participant is treated equally and with respect (Carson et al., 1989). In my study, I have successfully engaged a number of participants with diverse backgrounds and equally treated the data I received from each one of them. I tried to make each one of them comfortable to give their sincere opinion during our interviews, as well as emphasised the same in the feedback surveys.

7.2 Challenges and Limitations

The challenges I faced in collecting and using these data are listed and explained below:

1. Organisational challenges - since this is the first time such activity is organised in the framework and on the scale of UNESCO, it is uneasy to explain the purpose and the way the aims of the study are interconnected. It is also challenging to collect all necessary information

in full because of the intensity of the programme and participant's reluctance to give deeper feedback.

2. Linguistic challenges - participants come from different countries stretching from Cuba to India, so language issues make it more difficult to convey the message and exchange feedback.
3. Trustworthiness - since the GlobalMILHack and the 4-week followup programme are a competition for UNESCO funding, participants may be inclined to give more positive feedback to the organisers for the attempt to raise their likability.

7.3 Rigour

Ernest T. Stringer (1999) suggests that in order to establish trustworthiness of the study, action researcher shall report on four aspects of the research: credibility, transferability, dependability and confirmability. This is meant to assure the reader of the reliability of the presented outcomes and the study in general as not superficial, biased, or insubstantial.

Stringer also states that the prolonged engagement with study participants reinforces credibility of the study (Stringer, 1999). During my study I have regularly interacted with the participants over the four weeks of the Follow up programme. I was present in all of the meetings and calls that were relevant to the study, and provided my full and undivided attention to the process as a facilitator and as an observer. On top of that I made sure that information flow works smoothly for all members and partners of the hackathon and the programme, answering to enquiries and providing needed information and support in the learning and co-creating process. Triangulation of information for my research resulted from collecting data from multiple sources (feedback surveys, interview calls, concept notes, and my research diary).

Regarding transferability of the study Stringer concludes that “Transferability is established by describing the means for applying the research findings to other contexts” (Stringer, 1999). This study was done in an online multi-cultural environment and was implemented in the format of a team project competition. Few of the challenges that participants gone during the hackathon and the programme might apply to the online team learning and collaboration process in general.

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