



eCrisis

IO5 - eCrisis in the Wild Evaluation Report

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1. Introduction

The final Evaluation report (IO5) consists of the analysis of data collected from each project partner. This is aimed at validating the overall project's pedagogical approach and related didactic materials produced and tested during the project.

The report involves work on the evaluation of project outcomes widely in schools across Europe (IO5 Intellectual Output) via variant means of dissemination such as game (Iconoscope) competitions that took place online throughout the duration of the IO5, information days in Austria (E7 in February 2019), Malta (E5 in May 2019), Greece (E6 in July 2019), fairs and an international conference (E8) hosted in Austria in June of 2019.

Output description: Given the evaluation method for testing game-based learning (O1), the game scenarios implemented in the e-Crisis toolbox (O2) and the set of eCrisis materials dedicated to trained teachers (O3-O4), this output aims to evaluate project outputs (O1-O4) widely within formal (teacher training and school activities) and informal (game-based competitions) educational settings based on the principles of inclusive research. The output includes all non-academic stakeholders of the project in phases of research. They are perceived as co-researchers in order to get greater insight. The output is not based on doing research ON people but WITH them (Kremsner et al., 2016) and carefully considers ethics to ensure that expertise and skills are shared collaboratively. Each part of the research team brings a range of skills, expertise and experience to the work (Johnson, 2009).

Given this inclusive evaluation strategy for testing game-based learning widely, the game scenarios implemented the e-Crisis toolbox and the set of e-Crisis dedicated and trained teachers, this output can ensure far-reaching insight into the success of the project from the perspective of all key stakeholders. The main outcome of IO5 is the e-Crisis Evaluation report, which will summarize the wide evaluation results of all e-Crisis outcomes.

The output is also actively considered and share an exploitation strategy for project outcomes. IO5 has developed specific activities, networks and processes, that support the exploitation of project outputs at the European level, as well as at national and institutional levels in order to maximize and sustain their impact. Any exploitation plans should ensure that the ownership of the project results will be shared with stakeholders beyond the consortium partners, so as to extend their deployment opportunities.

2. Mixed Methods Evaluation Methodology

A mixed methods approach (Greene, 2007) was applied to cover the various parts of IO5. Both findings from qualitative and quantitative analysis are described below and will be implemented. Figure 1 visualises the evaluation strategy.

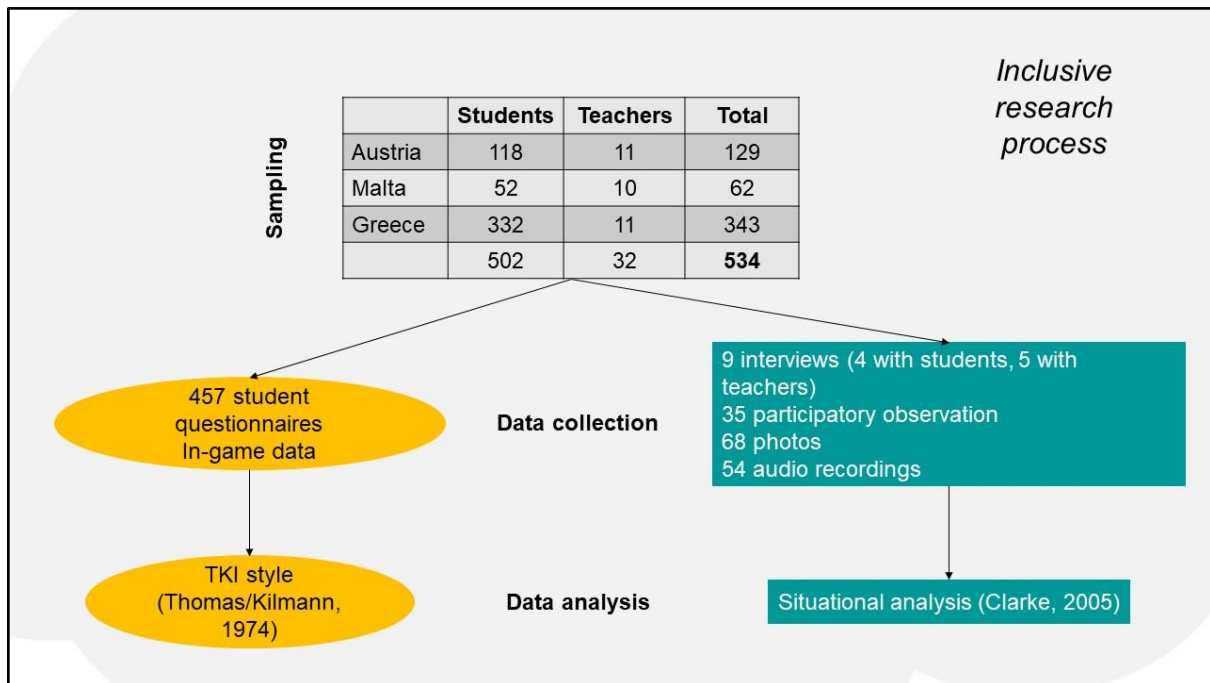


Figure 1. Evaluation strategy

2.1 Quantitative Elements of eCrisis Evaluation

The eCrisis framework contains two dissimilar yet interwoven game-based learning activities that collectively address the issues of creative thinking, reflective debate and conflict resolution (as shown above): *Village Voices* and *Iconoscope*. Our framework views these challenges holistically under the overarching notion of social inclusion (Schmoelz et al. 2016). In this section we outline methods for quantitatively evaluating the outcomes of the re-designed games for the purposes of the eCrisis objectives. In particular we focus on questionnaires directed to learners as well as in-game data collected per game (Yannakakis and Togelius, 2018). We conclude the discussion by raising potential questions that might be answered by the quantitative evaluation framework of eCrisis, complementing the qualitative approaches which are outlined above.

Students' questionnaire:

First of all, we were interested in demographic facts. Thus, the students were asked about country of origin, age, etc. It is important for the comparison of all three participating countries, to see the intersections and the differences according to students' social behaviour and usage of games.

The game *Village Voices* is about conflict resolution, thus the design of a questionnaire put an emphasis on constructs related to conflict (an aspect which easily can be tied to Situational Analysis as shown below). Earlier experiences of the consortium under the evaluation of the SIREN project identified the *Thomas-Killmann* Conflict Style (TKI) Questionnaire (Thomas & Killmann, 1974) as a potential quantitative approach to conflict resolution measurement via conflict styles. In particular, the consortium has designed an adapted version of the TKI questionnaire for students that was broadly used in the SIREN project evaluation. We have planned to use versions of the TKI across various time windows throughout the IO5 phase of eCrisis. Differences in learners' conflict styles across time will be identified and analysed. In addition to TKI, learners were constantly asked to self-report the level of conflict during the

game. Further, they were asked to indicate their current emotional state and express feelings for the other players every time a major action occurs (e.g. trade, stealing, etc).

The game Iconoscope can not only be viewed as being closely related to lateral thinking but furthermore it often constitutes a type of diagrammatic lateral thinking: creative thinking occurs through diagrammatic representations (e.g. in level design) offering visual (diagrammatic) alternative paths that satisfy a number of conditions. The students' questionnaire therefore focuses mainly on student's engagement in creative thinking, conflict resolution and reflective debating, as well as students' build up of digital media literacy competences. Additionally, it focuses on how the used tools provide students to deal with unprecedented everyday real-life problems in a creative and responsible manner. After asking for general information at the beginning (gender, age, nationality), the individual enjoyment of playing computer games is put into question. Then the students are asked if they are used to play computer games in groups and especially in class. Then they shall list the good points and the bad points of the eCrisis games and justify their answer. These questions are followed by a range of statements, where the students shall indicate to what extent they agree with the statements on a scale. They are about the personal improvement of digital media literacy competences, the cooperation with other classmates, the process of finding creative solutions, the handling with conflicts and the experienced support of the games for debating with classmates. There is free space for 3 statements, where students can also write additional information, which they wish to share, in their own words.

Educators' questionnaires:

Similarly, to students, the eCrisis co-researcher as well as other teachers were using versions of the TKI to cluster their students' conflict resolution styles over time. The styles derived from learners' self-reporting and teachers' reports were correlated. Educators were most likely defining the *ground truth* of conflict styles and their reports were used to validate the self-reports of learners. These aspects are also easily be combined with findings from qualitative data, as the educator questionnaire builds on the (social) situation of students from the perspective of their teachers.

In-game data:

Village Voices tracks a number of data during play that can be used for our quantitative analysis. In particular the game tracks:

- Key game events (trading, stealing, rumour spreading etc.) and their timestamp
- Key player actions that lead to each game event.
- Player ratings (5-point Likert items) after an action (e.g. "How do you feel about this action").
- Conflict ratings (5-point Likert items) after a key action and at the end of the game session/quest.
- Player emotional state after a key action. Options include: happy, sad, neutral, angry.

By collecting data for particular players, classes as a whole, or even countries as a whole, over time, temporal effects of using the game with regards to the player's emotional states, the game's conflict levels and associate these data with the conflict styles of the players as described above can be tracked. Cross-country/cultural/gender analyses are also possible given these datasets.

Iconoscope tracks a number of data during play that can be used for our evaluation of creative thinking. In particular the game tracks:

- The concept triplet chosen, and the description assigned.
- Assistants: we track their suggestions, which assistants were selected, which ones were disregarded.
- Progress of the icon drawing process, which is tracked through snapshots collected every 20 seconds of gameplay.

Repeatedly considering inclusive research approach, we follow a *peer-evaluation* methodology for evaluating creative thinking via Iconoscope. Through the Iconoscopes' website (<http://iconoscope.institutedigitalgames.com/>) players can

- a) rate (via 5-point Likert items) any icon that is available in the database and
- b) guess the underlying concept of each Icon.

The first results in average rating values per icon. The latter votes/guesses are aggregated to icon. The ambiguity score is a direct measure of creative (diagrammatical) thinking.

Community data: Particularly relevant to our evaluation of creative thinking is the feedback by the community of Iconoscope players, permitted through a persistent voting website for feedback on user-created icons. In particular the game tracks:

- Ambiguity score of each Icon as calculated post-gameplay through user feedback in the voting phase.
- Number of (correct or wrong) votes for each Icon (*popularity*)
- Average rating of each Icon.

2.2 Qualitative Elements of eCrisis Evaluation

For IO1, an “inclusive research” approach (Walmsley & Johnson 2003; Koenig & Buchner 2011; Nind 2014; von Unger 2014; Kremsner, Buchner & Koenig 2016) was implemented and functions as the basis for further planning, data collection and (partially) analysis. IO5 follows an inclusive approach and will therefore play a fundamental role for the general evaluation of the project.

Inclusive research can be defined as research which includes or involves non-academic people - for IO5: students, teachers and people with disabilities and learning difficulties as target groups. It involves people who are affected by social exclusion – in every step of the research process, from developing and framing research questions to data collection and analysis to dissemination (Walmsley & Johnson 2003); evaluation as planned in IO5 added in the context of the eCrisis-project. Leading principle of inclusive research is to do research WITH, not ON people with a focus on collaboratively sharing expertise, experience and skills - of course under careful consideration of ethical guidelines.

Additionally, to teachers and students, key stakeholders – e.g. the Vienna School Board, Centers for Special Educational Needs, and self-advocates – were included at different stages of the research in IO5; along with additional participating key stakeholders in Greece and Malta, they all have participated in IO5. Evaluating tools were developed in line with the ideas of those being researched. It is of utmost importance to eCrisis that all research activities are in accordance with requirements of practitioners and those affected by crises. Thus, all interested stakeholders were kept up-to-date and got insights at their request to ensure that

all relevant aspects are included as they come up. Therefore, demanding participation not only in selected areas but also in the design, formulation of research questions, analysis, and dissemination can also be interpreted as empowering and as an important facet of emancipation. But most importantly regarding IO5, this approach also leads to a low-threshold offer, as it enables those involved (especially teachers) to easily get back to games and materials provided, use them in schools and report feedback to research team members. Utilizing the “stage model of participation” (von Unger 2014, see below), a shift from “instruction” (stage 2, non-participation) to “partial decision-making power” (stage 7, participation) can already be displayed. This level of participation will be pursued throughout the eCrisis project and will have a fundamental role in IO5.

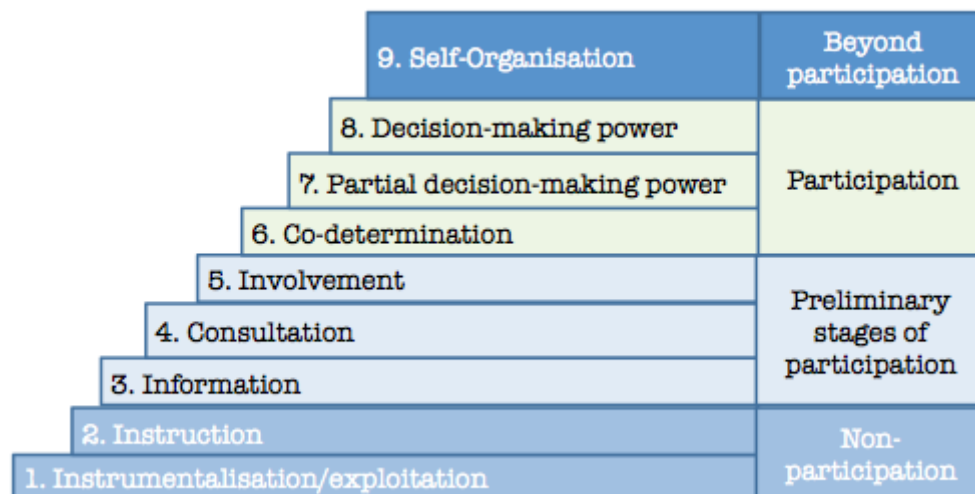


Figure 2. Model of stages of participation (von Unger 2014, 40; translated by the authors)

To illustrate the inclusive approach during the whole research process, the following section deals with practical implementation. The most important aspect for the research procedure was fulfilled in gaining inside views of students, teachers and other person's everyday life/work. Those wealthy perspective and approaches helped during the whole eCrisis project to work on teachers' training to foster inclusion in class with a game-based learning style. The diversity in class was also represented in the research team as not only ordinary university staff was hired. The inclusion of staff members who do not work in university-related contexts normally was very fruitful in understanding social inclusion. Nevertheless, some problems have occurred as well. The distribution of tasks was sometimes inappropriate because of different needs and conceptions. The biggest problem can be seen in bureaucratic barriers which i.e. exclude or prohibit the regular hirement of participating stakeholders. All in all, stage 7 “Partial decision-making power” could be reached frequently.

IO5 will tie up on research methods which were already applied for IO1. These are:

- participatory observation (Flick 2007; Lamnek 2010)
- problem centered interviews with students and teachers (Flick 2007; Lamnek 2010)
- reflective debate such as socratic-dialogues (Stenning et al. 2016), Narrative-Socratic Dialogues (Schmoelz 2016)

To analyse data, Situational Analysis (Clarke 2005 & 2009), a qualitative research approach that combines Grounded Theory Methodology (GTM) with Discourse Analysis, is applied in

IO5. The aim of Situational Analysis is to identify the social arenas to which a specific situation (such as the social situation of the participants at the time of and within the data set) is located and related, as they all mutually influence and constitute the situation and its actors (Clarke 2005). This approach proved to be particularly applicable for issues which focus on social inclusion and its antagonist social marginalisation/exclusion, as discourses influence and constitute every specific situation. By mapping nonhuman and human, material and symbolic elements of a particular situation (such as the participatory observations, reflective debates and problem centered interviews which constitute our dataset) and their relations, Situational Analysis in a first step allows us to sort the data in a structured and analytically reasonable way (ibid, 86). In a second step, we identified social worlds (understood as collective commitments), their sub-worlds, and their dependency on one another. In so doing, we gained a profound understanding of “how people organize themselves in the face of others trying to organize them differently” (ibid, 109). Positional maps finally lay out major discourses found within the data set. Situational Analysis additionally allows us to not only focus on qualitative data but to also incorporate results from quantitative evaluation, as it aims to understand and analyse situations in a holistic and fundamental way to track the roots of social marginalisation/exclusion while simultaneously exploring creative methods and tools of social inclusion.

Core steps of the inclusive qualitative parts are:

1. Core stakeholders choose students for the research process
2. These students act as co-researchers. They observe the workshops and make notes and pictures about observation.
 - a. Who plays?
 - b. Who plays with whom?
 - c. Who plays what?
 - d. Who plays how long?
 - e. What causes high levels of engagement between players?
3. Co-researchers explain notes and pictures to the researchers.

After explaining the methodological approach, the results of the analysis are presented in the next sections. Therefore, we have evaluated educators and students separately.

3. Evaluation: Educators

Following a participatory research approach, the educators, mainly pre-service teachers and teachers for primary and secondary school, were actively involved in the research process. In several IO3 training activities (C1 and C2 training events, national teacher training workshops), the educators got the chance to test, evaluate and improve the games, the eCrisis materials and the pedagogical frames. First, we summarize the educators' views regarding the eCrisis methodology and technology that we already collected through semi-structured questionnaires during the eCrisis training activities (IO3) and the preliminary phase of pilot courses in schools of Greece and Malta (IO4). Second, interviews were held with the educators in the period of IO5. The whole evaluation of educators lies the core focus of the three main aspects.

(1) Applicability for practice

- (2) Satisfaction of participants
- (3) Quality of workshop material

The first step of the project was to evaluate the current situations in all participating countries towards social issues in the classroom as well as the digital component gaming. The results of IO5 are shown in a comparison manner to the outcomes of IO1. As one result, five different barriers to social inclusion through games are identified (Schmoelz et al. 2016, 16). In reviewing the barriers, it can be seen if learning processes changed by using game-based learning as didactical method.

One barrier is found in dominant teaching attitudes. Various stakeholders of the project including the teachers themselves, parents, school administrators and even learners, are still of the belief that the classroom is the domain of the teacher. This perpetuates the idea that learning is teacher-centric, and that the teacher has to play the central role in classroom-based teaching and learning (ibid., 17). These findings are confirmed in the evaluation period of IO5. Although, the implementation of a game-based learning approach shows that teaching styles change. A new interactive playful teaching style can be seen. Hereby, the educators take a more passive role during class. They are moderating the interactions in class and do not take over control. With student class numbers reaching as high as 25 or more per classroom, along with heterogeneous class structures, teachers are finding it increasingly difficult to deal with social inclusion issues. Diverse learning needs, including those related to impairments and disabilities as well as migrant culture backgrounds, tend to be set aside in favour of other priorities, such as assessment and learner performance, and the covering of the subject syllabi. This in itself reinforces social exclusion and provides to be a barrier to supporting social inclusion and creativity in the classroom (ibid., 17). That statement is also confirmed by IO5 evaluation. Educators are still working very concept orientated. But there is a tendency to take over students' perspectives while students are taught in an interactive playful teaching style. It also allows students to cooperate with each other more than usually. Cooperation and interactive playful teaching foster students' creativity and imagination and is less boring than teacher-centric class. Nevertheless, as teachers have observed themselves, curricula, parents' expectations cause substantial amount of pressure on them as the performance of the students, especially during exams, seems to be directly related to the amount of content that they as teachers manage to transfer to their learners. The confirmation of a tough school life can be read in teachers' interviews of IO5. Teachers want more time to discuss, reflect and debate in the classroom because those are necessary competences which students need to learn. Here, educators face another barrier which was identified in IO1: curriculum dilemma. The current curricula in all three countries do not allow teachers to be flexible to shift contents (ibid., 17). The next barriers follow the first main aspect.

(1) Applicability for practice

First, teachers often tend to favour teaching in the same way as they have been taught how to teach. This does not include using innovative uses of technology-driven devices, applications and software. The perceived limited skill set leads the teachers towards limited self-belief in their capabilities to handle technology in class (Schmoelz et al. 2016, 17). Also, this barrier is often mentioned during the educators' interviews. Additionally, the technology itself is pointed out as problematic. That shows a repetition of an already identified barrier which impacts the applicability for practice.

A barrier to implement game-based learning in classrooms to foster social inclusion are limitations related to technology and lacks accessibility (ibid., 16). These include accessibility to technology concerning the possibility to afford devices or to have sufficient and stable WIFI- or network connection at home as well as when being used for classroom activities (ibid., 16). Some fractions of schools do not have access to technology. This includes access to computers, digital devices, smart phones and access to the Internet. Children and youth are affected by it and most often these would be representatives of the most disadvantaged people living in society. Most often students who have no or limited access to technology would already be at risk of social exclusion due to poverty, disabilities or impairments, cultural differences and migrant backgrounds. Whilst using technology at school would be commendable and even recommended, the fact that these people would be unable to access the same programs and applications from home like their peers would raise more issues that might set the seal to more social exclusion unless provisions are made to reverse the situation. When talking with teachers, especially those working with disadvantaged students or students at risk of social exclusion, they show a reasonably justified concern towards this barrier. That problem shows again in the last evaluation period of IO5. Schools are not up to date when it comes to accessibility of technology in generell. Thus, infrastructure in school cannot compensate the gap and inequality which appears of social differences. However, the technological barrier does not only exist for students and young people. The technological barrier also occurs in all held teacher interviews. They point out that even if they want to teach with a game-based learning approach there are no resources according to time, money and equipment. Thus, teachers have to invest time and, in some cases, their own money to teach with media. That is why digital media in general just take a marginal position in class. Mostly digital media are used for research over the Internet to gain factual knowledge.

Specifically, educators from Greece, Malta and Austria during their training played the eCrisis games, Village Voices and Iconoscope, in order to familiarize themselves in using eCrisis toolbox in their classes and proposed further improvements of the games. The data collected from these questionnaires led to further improvements of the games.

As far the Iconoscope game is concerned, they estimated the difficulty of understanding the concept of the triplets and they proposed the triplets that should be included in the game. At this point, it is important to note that educators by selecting the Iconoscope DIY version can create their own triplets according to the needs of their students. In addition, the educators found the Village voices game attractive as an educational tool and they stated that they are planning to use it frequently in their classes. The aspect of the game that they found most attractive is the relationship that is created between the players and their interaction. However, the installation and the starting-up stage of a game are the most difficult parts of the game according to educators' opinions. They also proposed improvements such as the graphics, the fond, the gender of the characters and the missions of the game.

(2) Satisfaction of participants

Many teachers also observe that they do not feel comfortable with their skills nor the right attitudes towards implementing technology-driven practices in their classroom. Towards the fear of failing in many cases, digital devices are not common in classrooms. Unfortunately, many schools do not have access to devices due to budget reasons. In some cases, the devices were acquired, but aren't used due to lack of ideas, knowledge, proper learning materials, easy usability and (fast) technical support if problems occur. Despite this, teachers

do take initiative and even go through experimentation to try and implement novel digital practices in class. However, they do encounter yet another barrier in the way technology, additional devices and digital practices can be further developed and exploited with young people who may have diverse and special learning needs. However, most often this is a matter of trial and error as would be the applications which they would choose to use in class. This leads them to reflect on whether their experimentation in class would indeed lead to increased learning benefits, and when weighing against the increased risks they perceive, most often they decide to abandon their initiatives in favour of practices which they would be more familiar with and thus more confident to use. The aspect that most educators are unfamiliar with an digital-based teaching style is confirmed by the interviewed teachers. They required the need of more teacher training to improve their knowledge and skills according to the usage of digital media in class.

(3) Quality of workshop material

The following section is divided in two different aspects. First, the implementation of the eCrisis games are discussed. Second, the workshop itself is evaluated by the interviewed teachers.

The teachers who were involved in the training carefully designed and planned the implementation of eCrisis games at schools of Greece and Malta. Teachers made comparisons to the traditional methods, commented on and evaluated eCrisis methodology and technology. Firstly, all Greek teachers except one stated that they are interested in using eCrisis approach in class for a variety of reasons. The teacher that responded negatively in this question does not use technological tools in her class. The other teachers believe that the eCrisis methodology is as an interesting, different way of reflection about social problems and in general the methodologies that are relative to the way of handling relations and conflicts are of great interest to them. Furthermore, they think that children are willing to get engaged with the process when using eCrisis methods. Another reason is that the eCrisis methodology cultivates the spirit of teamwork and self-efficacy to students.

They believe that Village voices game encourages autonomous and explorative learning. It also motivates students to collaborate and to communicate. Moreover, reported that they would like to incorporate the Iconoscope game in their teaching methods because it contributes to the development of creativity and strengthen social and group skills. In general, they believe that students pay attention in a game-based setting and understand easily through playful methods. Compared to conventional methods, students appeared to be more motivated.

In addition, the Maltese teachers would like to use eCrisis approach first and foremost because they believe it is the way forward to include technology in the classroom and to keep updated with today's lifestyle. They think that the eCrisis games are two flexible games that could be included in various areas and topics and can be an aid to the learning outcome. Furthermore, children pay more attention when there's a type of a game involved and tend to understand things more in a game-based setting. One teacher declared that eCrisis methodology promotes specific values, foster creativity and imagination and the learner curiosity so that the children would make the problems their own. According to another teacher's opinion the eCrisis vision can be a means of resolving conflict resolutions.

The following qualitative outcome shows that all teachers said that the technical implementation of Village Voices was hard. Therefore, some teachers had to get support of an IT-specialist colleague. After the installation and implementation, the games shut down after playing it for a while. The students were very frustrated because the teachers were not able to restart it. Thus, without an IT-specialist teacher Village Voice was not running. In other schools, the technical resources to implement Village Voices were not given. The game worked with a lot of time investment and additional support. It is not very reliable to use it in class, just when the lesson is planned intensively. On the contrary, Iconoscope was rated very reliable by the teachers. The online access is very easy for teachers as well as for the students. No additional support was needed. The only negative aspect was a disconnection internet connection. Thereby, creative and spontaneous solutions occurred. The students transformed the game analogically. They used paper and pens to draw the triplets. The teachers mentioned that the game was a lot of fun for the students.

The workshop was evaluated by the teachers critically. The students enjoyed the gaming session which verifies their beliefs that social activities foster the class community. The reason can be found in less conflicts while playing compared to normal classing. They felt that the students liked it and wish a repetition of the workshop. Nevertheless, the teachers criticized the autonomous character of the workshop. Some think that the students needed more guidance during the session. The students seemed overburdened with the eCrisis games. On the other side, some teachers said that their students got into the workshop and explored the games on their own. The guideless frame enables the students to choose whether they want to play alone or in groups. It considers each student's needs.

4. Wide evaluation: Students

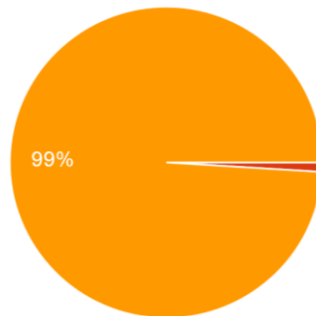
The student evaluation is divided in a qualitative and quantitative approaches. The data collection took place during the game-based activities in schools and informal educational gaming competitions. All activities are reported in Chapter 5. Additionally, the evaluation includes the demonstration to what extent the project outputs (O2-O4) have provided adequate material and activities to allow participants to deal with respective challenges within our Europe in Crisis.

The evaluation focuses on the four different dimensions related to the project proposal. First, the students were asked general facts to gain an idea about framing aspects like age, gender and country of origin. The second dimension deals with the question if the students were successfully engaging in conflict resolution, creative thinking, and reflective debating. The third aim is building students' digital media literacy competences. Last, the eCrisis methods should provide tools to deal with unprecedented everyday real-life problems in a creative and responsible manner.

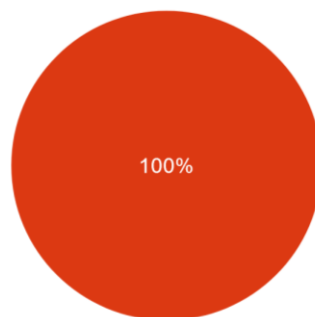
4.1 General facts about the participating students in Austria, Malta and Greece

Overall, 487 students attended the gaming workshops in the IO5 period (January 2019 to March 2019). In Austria, 103 students filled in the questionnaire. The first question asks for

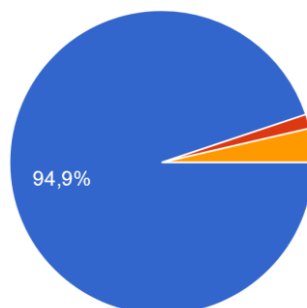
the county the student lives in. Hereby, different colours indicate the country: Austria is coloured in orange, Greece is coloured in blue and Malta is coloured in red. The 99% of the participants said that their country of origin is Austria. On the other hand, 1% indicates Malta as a country of origin. It can be interpreted that 1% of the students were making fun out of the study or live in Malta and do an exchange.



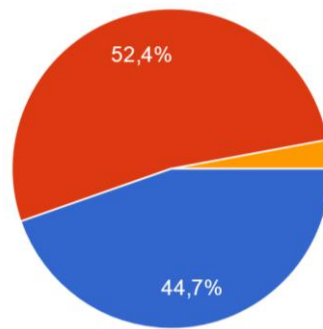
In total, 52 students filled in the questionnaire in Malta. Everyone marks Malta as country of origin.



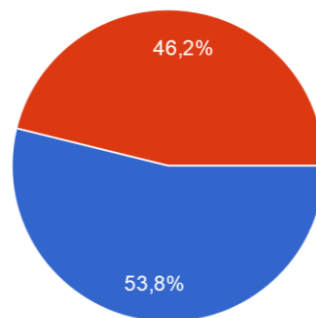
Most of the students came from Greece. In total, 332 questionnaires were handed in. Out of 332 answers, 315 students said that Greece is the country of origin (94.9%). 13.6% indicate themselves as Austrian. It can be assumed, that it correlates with the fact that the participating school is a German speaking college. A lot of children with migration background are visiting that German school. Nevertheless, 1.5% of the students filled in Malta as a country of origin.



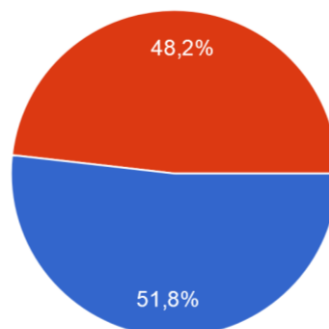
The second question aims to evaluate the students' gender. Therefore, the questionnaire provides three options to fill in: male (blue coloured), female (red coloured), diverse (orange coloured). In Austria, 52.4% crossed the category female, 44.7% of the participants have indicated a male gender and 2,9% indicated a diverse gender.



In Malta, 53.8% of the students said that they are males. On the other hand, 46.2% filled reported to be female; no participant chooses the category diverse.

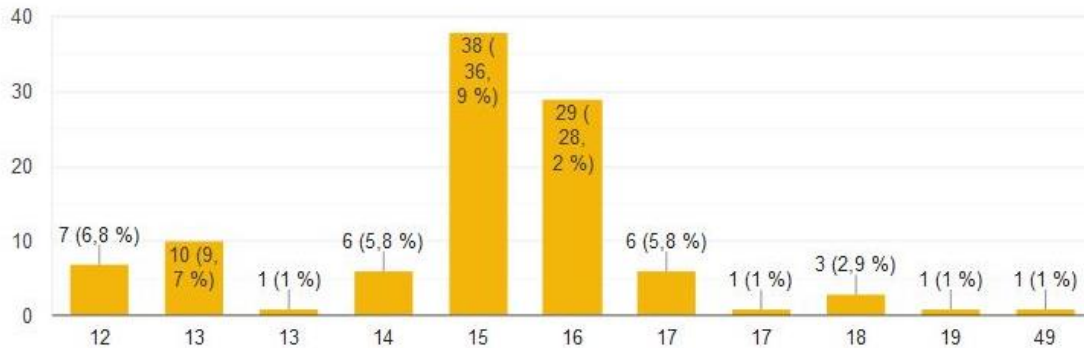


In Greece none of the students assert themselves as diverse: in particular, 51.8% of the participants said that they are male and 48,2% of the students indicate to be female in a rather gender-balanced study as well.

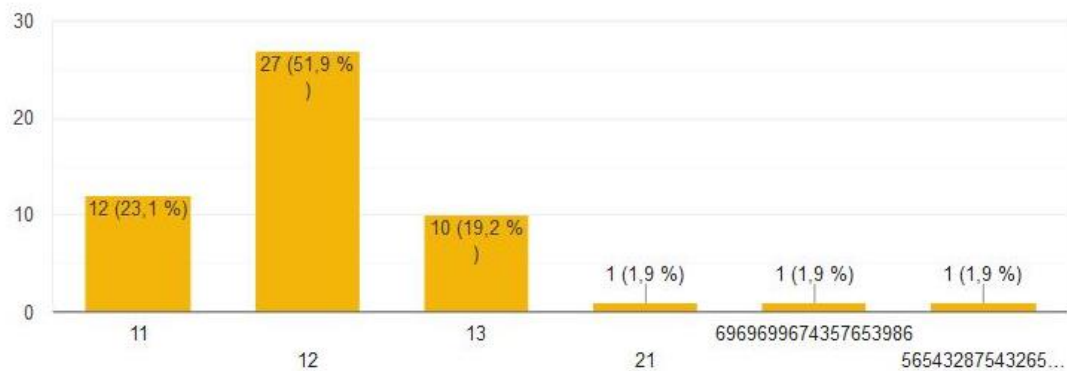


Related to the category of gender, one is male and five females out of the six interviewed students. Closing the gender aspect, teachers reported in the interviews that girls in puberty are facing the problem to speak in front of boys in class. Up to the teachers, girls feel not comfortable speaking in front of boys because they feel judged. The teachers reported that it has a big impact on girls' performance in class. During the eCrisis workshops gender equality was notable.

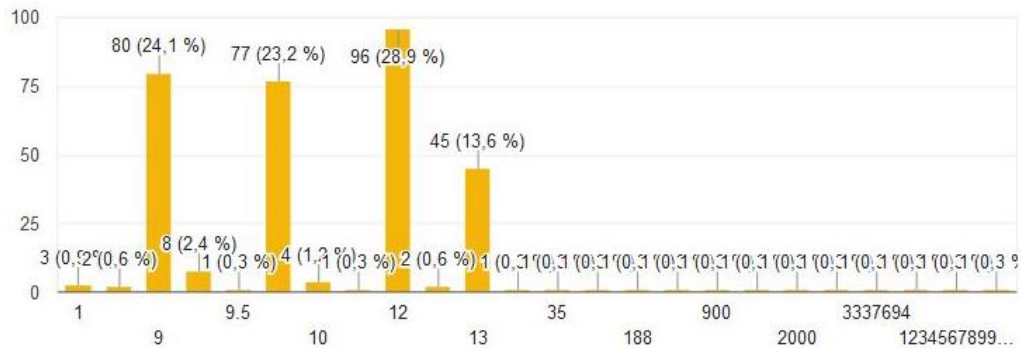
The target group of the project were students in primary and secondary school. The students had to fill in their age, to evaluate exactly the range of students' age. In Austria, the students are between 12 and 49 years old. 6.8% of the participants are 12 years old, while 1% filled in the age of 19. Most of the students are 15 years old (36.9%). One person indicated an age of 49 years and there are two assumptions made for this outlier: either a teacher filled in the questionnaire mistakenly or a student mistakenly (or even purposefully) decided to enter such value.



In Malta, more than half of the students are 12 years old (51.9%). Followed by 23.1% who filled in that they are 11 years old and 19.2% who filled in the age of 13. The rest of the students indicate to be 21 years old or older. This outlier can also be interpreted as an erroneous entry or purposefully for making a claim (or a joke).



A similar phenomenon can be seen in Greece. There, it seems that students also used the age question as a form of joking as they filled in unreliable numbers (e.g. higher than 80). A participant claimed an age of 35; thereby, it could be interpreted that a teacher filled in the students' questionnaire mistakenly. 28.9% of the participants are 12 years old followed by the age of 9 (24.1%) and 23.3% who indicated an age of 10.



The majority of the students are between 9 and 16 years old. In Greece, students are the youngest because the school workshops were held in primary school mainly. In contrast, the Austrian students were older because the workshops were only held in secondary schools. After asking for general facts, the questionnaire provides content-based questions. Those questions aim to evaluate the students' experiences during the gaming workshops in schools.

4.2 Students' engagement in the competences: creative thinking, conflict resolution, and reflective debating

The next questions are based on the three main soft skills to foster social inclusion in the classroom. The used games aim to engage the students in conflict resolution, creative thinking and reflective debating.

Additionally, to the three main competences, the students are asked to note what they liked or disliked about the eCrisis games. The students wrote down the following statements. It is a collection of statements because of the high amounts of answers. The selection criteria are related to competences which foster social issues and inclusion through games.

- It was very good to play in groups. It was funny and fostered the class community.
- It was nice to play with friends. It was not so nice that there were too fewer digital games.
- I think Village Voices was too complicated.
- It was a good co-op experience.
- There were no strict limitations.
- It helps people express themselves.
- Good point is that you can express what you feel, and the bad point is that u don't have enough shapes (Iconoscope).
- You get to know how everyone thinks.
- It can help you understand the words and work in groups.
- You can express your creativity!
- It makes lessons interesting and more understandable.
- It makes the lesson more interesting and less boring because you get tired of the teacher talking and talking very boringly.

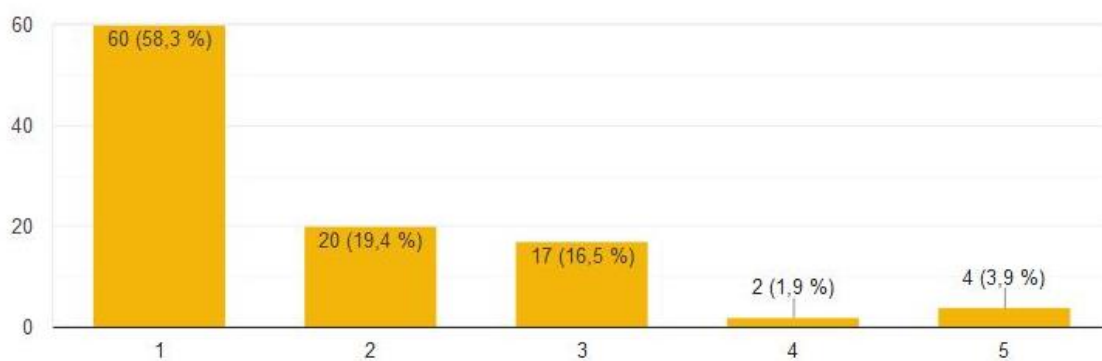
The students' answers show four main outcomes. First, students liked the gaming sessions because they worked collaboratively. Second, they also mentioned that the class community is fostered by playing games. Third, playing in the classroom seems fun and more interesting than traditional classes. This result refers to the outcomes of the educator's evaluation in Section 3. Fourth, the students discussed the provided games with a critical view. They listed pro and cons for Village Voices and Iconoscope.

To underline the evaluated outcomes, the student's opinions in the interviews show: Playful activities and interactive learning promotes public engagement and socialisation. They think that playful activities foster class community more than traditional teaching. That argument shows up repeatedly. It is a lot more fun to learn while playing and they get to know each other better because they interact in a cooperative manner instead of working individually. This finding also strengthens the quantitative results. Those general engagements are evaluated with more specific questions aiming to student engagement in conflict resolution, creative thinking and reflective debating. The responses to these questions are detailed below.

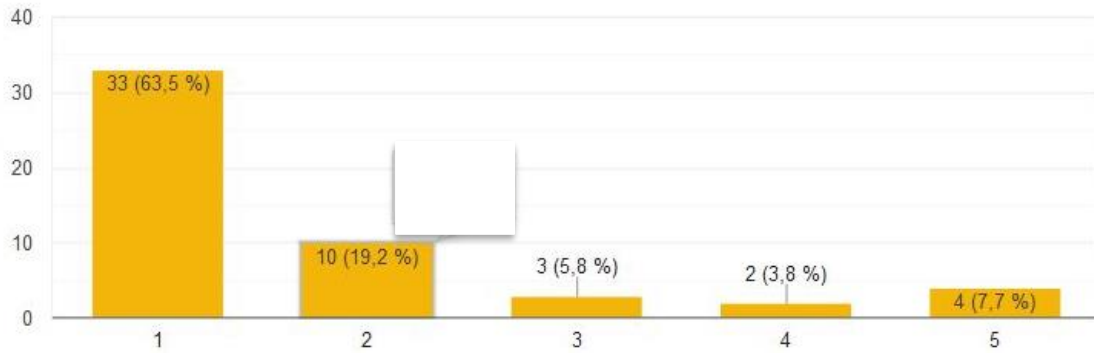
4.2.1 Creative thinking

The first statement on the above-mentioned dimensions reads as follows: I managed to cooperate with my classmates while playing the games. The scale was set up from 1 (strongly agree) to 5 (strongly disagree).

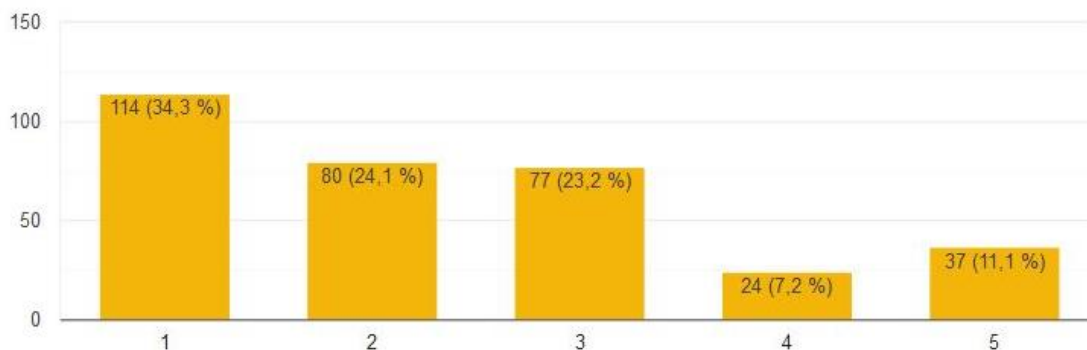
In Austria, 58.3% students strongly agree that they managed well to cooperate with their classmates. In contrast, 3.9% did not manage well with the cooperation. 19.4% of the students show that they agree whereas 16.5% of them have a neutral option on their cooperation behaviour in class. Just 1.9% filled in that they do not agree.



In Malta, 63.5% of the students managed to cooperate well; this is slightly higher than Austria. 5.8% of the participants are neither agreeing or disagreeing with the statement whereas 3.8% are disagreeing.

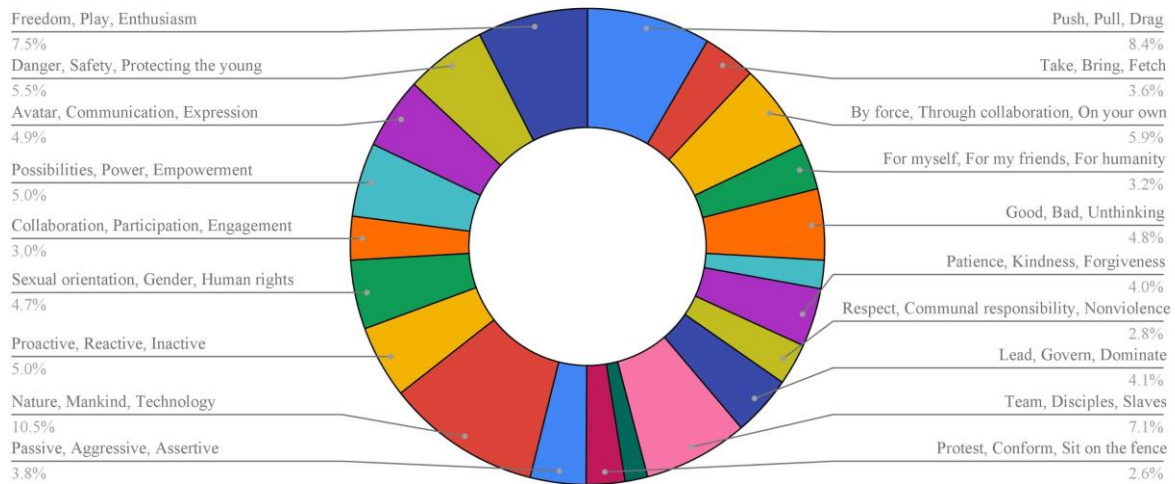


In Greece, the distribution is more uniform than in the other two countries. In particular just 34.3% of the participants strongly agree with the statement and more than 11% strongly disagreed. Almost the same number of students agree with the statement that cooperation went well (24.1%) and 23.2% are neutral about it. The smallest percentage of participants (7.2%) disagreed with the statement.



The students reported in the interviews that in regular class it is less easy to be creative than in the eCrisis workshop. But still, there is space to include own ideas and solve tasks in different ways. In the discussion after the gaming session the students expressed their dislikes about Iconoscope. Some students were confused by the design and the rules. They could not figure out how to play it nor the sense of the game. During the discussion, peers explained that the game deals with creativity. Thus, some students argued that it would be more helpful to draw the chosen expression with a pen. They felt very limited by using just the provided forms and colours. They tried to find solutions by exchanging ideas with their classmates, despite of asking the teacher or workshop leaders. On the other hand, some participants could play the game after some time of orientation. Hereby, the students mentioned that the virtual assistants confused their creation processes and were not helpful in general. Additionally, there were several problems with the user interface. Interestingly, the students asked if we will implement and realise their recommendations and advices for the games. Herewith, the participative character of the eCrisis workshop can be proved.

Furthermore, the next section deals with outcomes of surveyed in-game-data of the eCrisis games. Iconoscope realizes the very nature of lateral thinking which, as a creativity process, is boosted through constrained spaces of solutions (De Bono 1970). The following figure shows which triplets were chosen the most by the students.



The triplet “nature, mankind & technology” is the most chosen one (10.5%). Followed by, the triplet “push, pull & drag” with 8,4% and the triplet “freedom, play & enthusiasm” with 7.5%. The students used the following three triplets the least: “collaboration, participation & engagement” (3%), “respect, communal responsibility & nonviolence” (2.8%), “protest, conform & sit on the fence” (2.6%). It seems that the participating students show the tendency to choose triplets which are close to their everyday life and less abstractive. All the most chosen ones offer the possibility for a variety of images.

After curation by educators and administrators for offensive content and clean-up of corrupt data, a total of 1555 icons were collected during the 45 months of the online Iconoscope lifetime. These icons received 3774 user responses through the website’s gallery: these responses include guesses, ratings, or both. 835 responses included a rating of the icon in terms of appeal. Such ratings were only offered on 521 of the 1555 icons; it can be assumed that only some of the icons captured the attention of the audience enough to receive ratings (even if that rating was bad). The mean rating of the 521 icons was 3.15 out of 5, although 27% of icons had an average rating of 5, the maximum score. Moreover, 3710 out of 3774 responses included attempts at guessing the depicted concept. Most icons were annotated in this fashion, as 1370 of the 1555 icons (88%) received at least one attempt at guessing the concept. Most icons received one or two guesses, with only 34 icons receiving more than 10 guesses. The highest ambiguity score among these 1370 icons was 907 out of 1000.

In summary, given the in-game data and community data we can track in Iconoscope, we can partially recreate the gameplay of each session (design of each Icon). By collecting data for particular players, concept triplets, classes as a whole, or even countries as a whole, over time we can derive the temporal effects of using the game with regards to the player's ratings, Icon complexity, number of votes (correctness, popularity) and most importantly the ambiguity score over time.

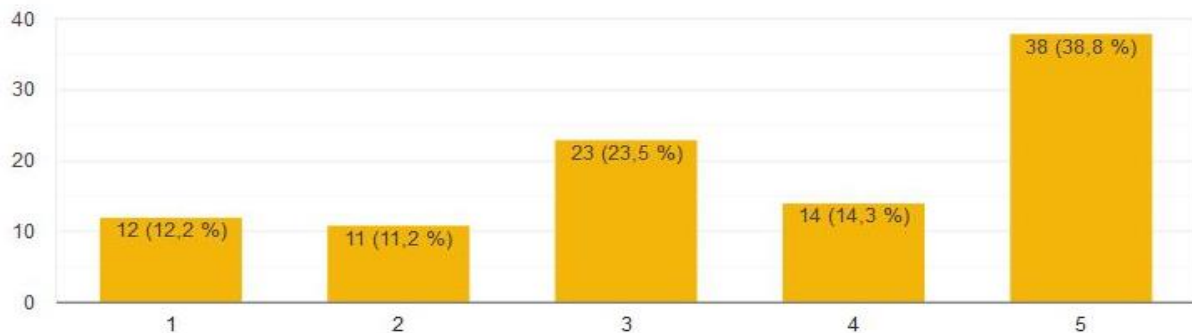
To summarize the surveyed quantitative and qualitative figures, it became clear that in all countries, the cooperation between peers worked out well. According to creative thinking, they experienced a creative way of learning. Normally, they are not used to deal with creativity in class. The game Iconoscope helped them to reflect on creativity and offered the possibility to work together, which was very important for them. Besides that, they described the game as

somewhat confusing in the beginning, but most of them managed to find solutions and fulfil the tasks. One remarkable output is that some students felt limited in their creative process while playing Iconoscope. This is for example related to the game design which provides a certain range of colours and forms.

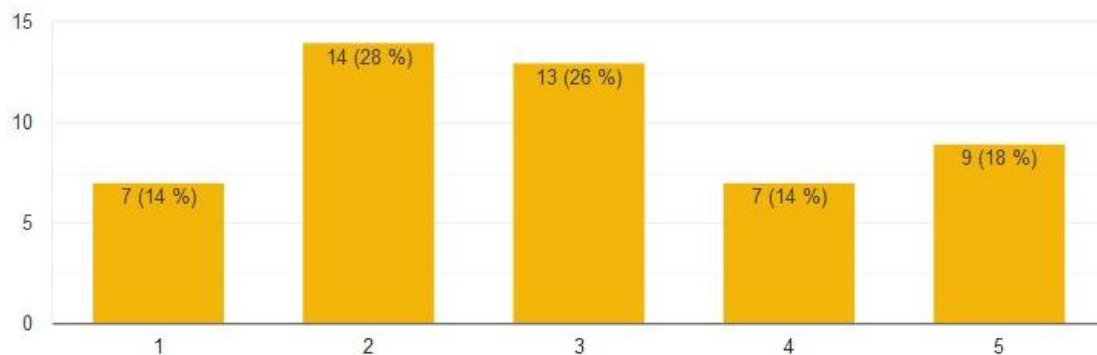
4.2.2 Conflict resolution

The second statement aims to evaluate the impact of the playing session to help dealing with conflicts. The statement says, “The workshop activities helped me to deal with conflicts”. Also, a scale from 1 (strongly agree) to 5 (strongly disagree) is used.

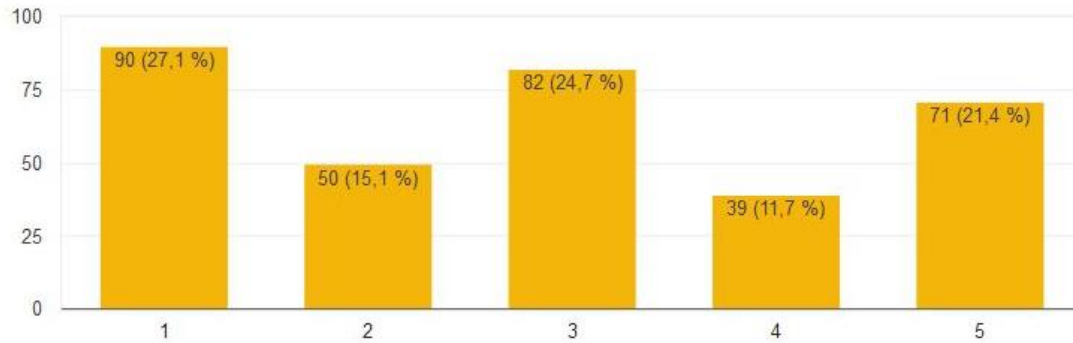
Most of the Austrian participants disagreed with the statement strongly (38.8%). Followed by 23.5%, who were neutral about the statement and 12.2% who agreed strongly with the statement that the gaming session helped them to deal with conflicts. Fewer participants (11.2%) agreed that the activities helped them to deal with conflicts whereas 14.3% disagreed with the statement.



In Malta, the distribution is more uniform compared to Austria. Mostly, the student agreed with the statement (28%). A bit less of the students (26%) neither agree nor disagree. While exactly, 14% of the participants agreed strongly or disagreed. 18% of the participants strongly disagreed on it.



In Greece, the students tend to fill in the extremes: 27.1% strongly agreed whereas 21.4% strongly disagreed with the statement. Conspicuously, 24.7% of the participating students are neutral about the statement. Just 15.1% of the participated students agreed and fewer of them disagreed (11.7%).



To deepen the survey, the students are also asked to note what exactly helped them to deal with conflicts. Some expressive answers are collected above.

- We had to sort out indifferences and discuss, what we had to do.
- The fact was both agreed and had to find the disadvantages and advantages.
- Meditation
- Communication
- Collaboration
- Patience
- Listen to each other

The students had a clear image on conflict resolution. All answers had one thing in common. It is just possible to solve the conflict when there is a collaborative and cooperative way of working together. No one pointed out that it is possible to solve conflicts just by his/her own.

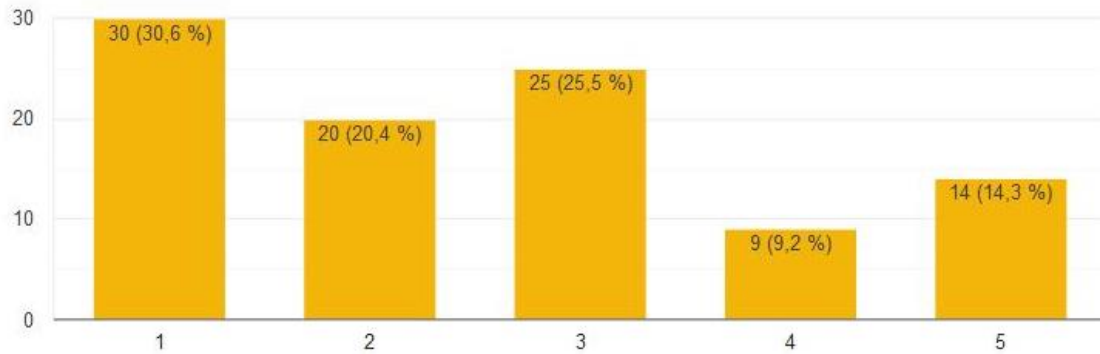
The interviewed Austrian students reported that they improved their skills of conflict resolution with different activities. Mostly, the activities were playful, and game based. They mentioned that a well-working class community is important because they spend a lot of time with each other. Especially, the eCrisis workshop and the game Village Voices helped them to gain and deepen peers' trust. On the other side, it also can be experienced how it feels to lose trustworthiness. Some students mentioned that they are used to team-building events. Thus, the effect of the workshop was not as high. They also pointed out that communication is the key to conflict resolution through different examples that were demonstrated by the students themselves. Interestingly, the students not only mentioned conflicts with peers; conflicts with teachers or other authorians were also mentioned to be solved via communication. In general, all students indicated that there a few conflicts within the class community.

To summarize the surveyed quantitative and qualitative figures, there is a big variety in the student's perceptions. Austrian students experienced that the eCrisis methodology does not help to deal with problems. In Malta, students were not sure if the games are helpful or not for conflict resolution. In contrary to Austria, the Greek students agreed or strongly agreed with the statement that the workshop activities helped to deal with conflicts. As a general fact, all students pointed out that cooperation and collaboration is essential for finding conflict solutions. All in all, they realised that playful activities as a method can be very helpful to deal with conflicts and their resolution.

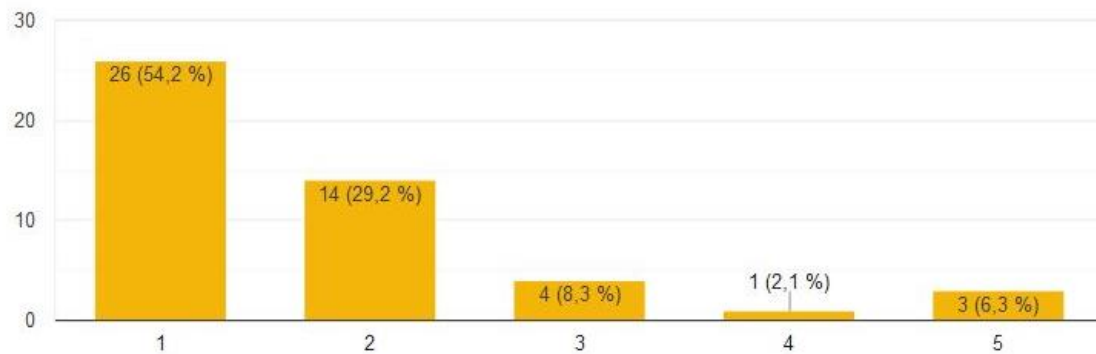
4.2.3 Reflective Debate

The third statement in the category was as follows: “The activities helped me to discuss with my classmates”. Responses to that statement would help us to evaluate the students’ skills related to reflective debate.

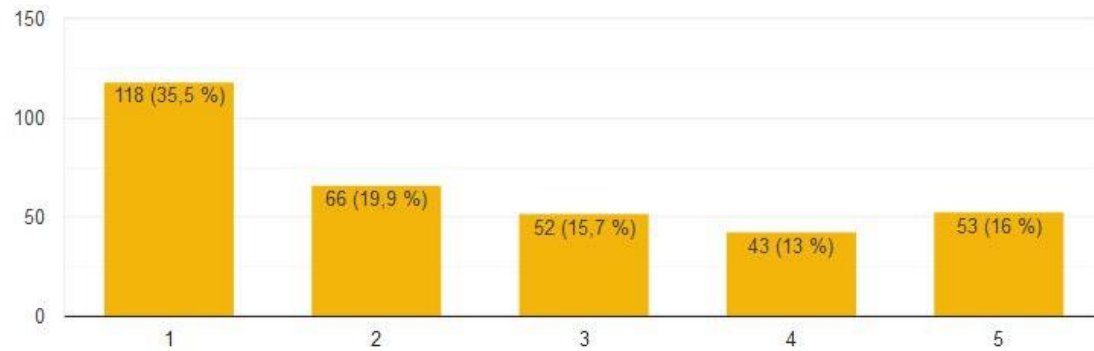
For Austria, the majority of students indicated that they strongly agree with the statement (30.6%). One-fifth of the students agreed with the statement and a bit more than 25% were neutral about it. Just 9.2% responded that they disagree, while 14.3% said they strongly disagree.



Most of the Maltese students conform the statement that the activities helped them to discuss with their classmates (54.2%). 29.2% of the students agree with it while 8.3% neither agreed nor disagreed. Just 2.1% says that they disagree. Finally, 6.3% strongly disagree with the fact that the activities helped them with discussions.



In Greece, the distribution of responses is closer to the Austrian responses. In particular, 35.5% of the participants strongly agree with the statement. The three options in between the extremes were distributed quite uniformly with 19.9%, 15.7%, and 13% of the responders, respectively, agreeing, being neutral, and disagreeing with the statement. Finally, 16% of the respondents strongly disagree with it.



To deepen the survey, the students were also asked to note what exactly helped them to discuss with their classmates. Some expressive answers were:

- Possibility to choose a game
- Possibility to play in groups
- The game Iconoscope (choosing the triplets, the drawing part, voting)
- Possibility to play digital and board games
- Negotiation of game rules

In general, the surveyed responses show that the students' possibilities for free choice of the game and the fellow players were essential for getting in discussions with their classmates. Interestingly, students experienced digital and board games as very helpful.

The next section presents the interview evaluation where the students are also asked about reflective debating. The students said that the eCrisis games helped them to learn something new. They were not sure about the rules of the game. The confusing and unclear rules led to discussion. The rules were figured out together discursively. On the contrary, the students marked that the games were very interesting, playful and emotional. The students were forced to deal with each other's needs to solve emotional interactions. In general, the students pointed out that they accept and respect each other even when it comes to discussions sometimes. It was very important to stress out that everyone stands for his/her own meaning without being judged or excluded.

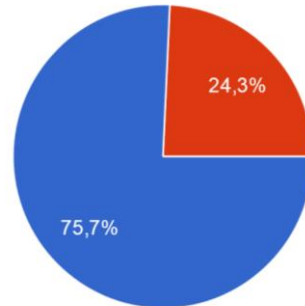
To summarize the surveyed quantitative and qualitative figures, all asked students made clear that the eCrisis methodology helped them to discuss with peers. Furthermore, they mentioned that the workshop offered them a lot of space to choose and participate, as well as to discuss with their classmates. The interventions of researchers and educators were limited, and students experienced themselves as competent and self-advocated when it comes to finding solutions.

4.3 Students building digital media literacy competencies

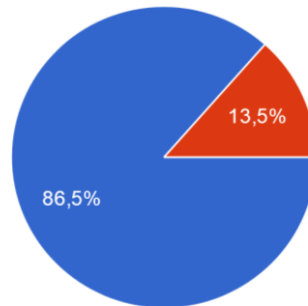
There were also questions focusing on how the games foster building digital media literacy competencies among the students. The following pie charts are depicted in two colours: the blue area represents the students who agreed (said yes) to the question, while the red sector

represents those who disagreed (said no). The first question focused on the general experienced enjoyment while playing computer games.

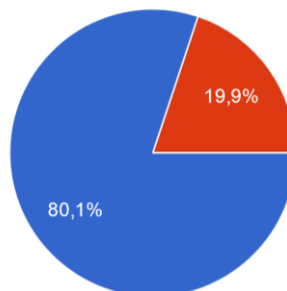
In Austria, around three quarters of those surveyed said that they like playing games on computer/tablets.



In Malta, there were even more that enjoy playing these games: 86.6% said that they like playing games on computer/tablets.

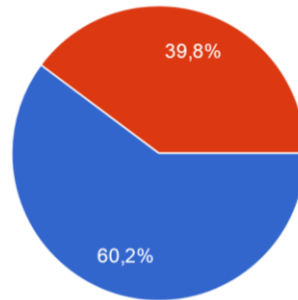


The surveyed figures of Greek students show that 80.1% of the students in general enjoy playing computer games. So, the numbers lay higher than in Austria, but lower than in Malta.

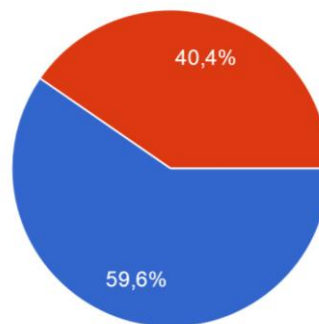


The second question was focusing on student habits with regards to playing computer games in groups. In particular the question asked was as follows: “Are you used to play computer games in groups?”

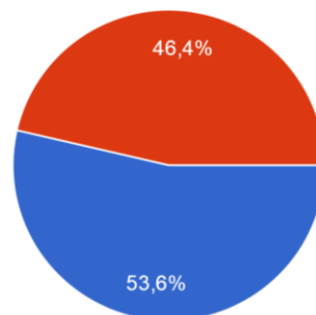
In Austria, more than half of the students interviewed are used to play computer games in groups. So 60.2 % experienced this kind of playing with others before.



For Malta, the situation is nearly the same: 59.6 % of the students are used to play computer games in groups.



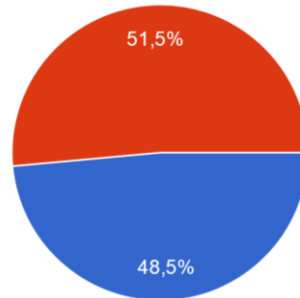
In Greece the surveyed figures show the lowest rate: only 53.6% of the students have experienced playing computer games in groups before. So, the results also show that nearly half of them are not used to play these games in groups.



All in all, the surveyed figures on this question across all three countries suggest that building digital media literacy competencies is not supported as it could be while playing computer games in groups. A high number of students does not seem to have the experience to play these kinds of games in groups and foster their competences in these peer-to-peer situations.

The third question concerned the use of computer games in the classroom. The particular question was as follows: “Are you used to play computer games in class?”

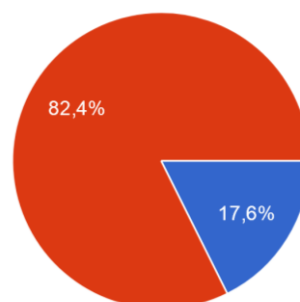
For Austria, the figures show that more than half of the participants (51.5%) answered “no” to this question. This suggests that over half of the interviewed students are not used to play computer games in their classroom.



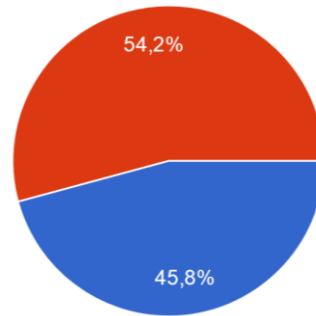
The interviewed students reported that they almost never play in the classroom. They also mentioned that they like to play more because normal traditional teaching can be boring. Especially, individual work is not as fun because there is no communication and interaction among the students.

These surveyed responses can also be seen in the qualitative outcome: Students in Austria do not experience playing games as a component in the classroom, even though they enjoy it very much. Beside their general enjoyment, a big interest, enthusiasm and emotional participation while playing could be observed during the workshops. The usage of games in class is limited by technical requirements of schools, institutional structures and by the digital media literacy competencies of teachers. If games are used in Austrian schools, they are often targeted on learning objectives and follow specific educational aims. As a result, students do not experience open game sessions, which they co-design or where they can deal with social issues.

In Malta, the students seem to have even less experience with playing computer games in class: 82.4% of the surveyed children are not used to play these games in school. Only a minority (17.6%) have experienced the practice of playing computer games in school with their classmates.



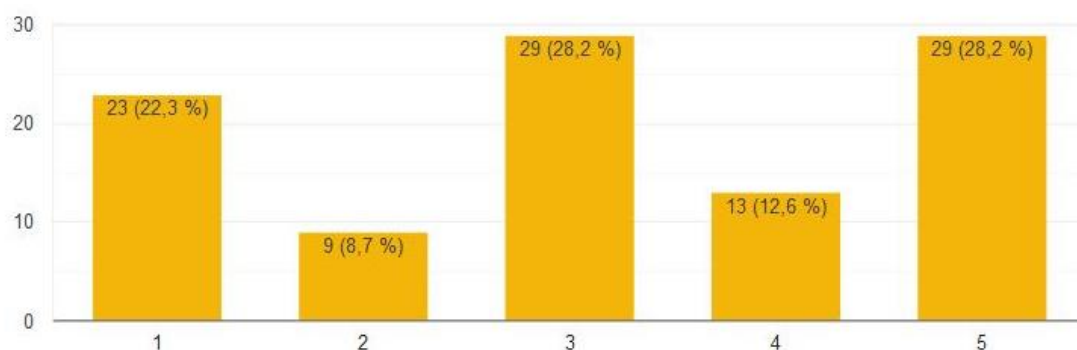
The surveyed figures in Greece are quite close to those in Austria: 54.2% of all students responded that they are not accustomed to play computer games in their school.



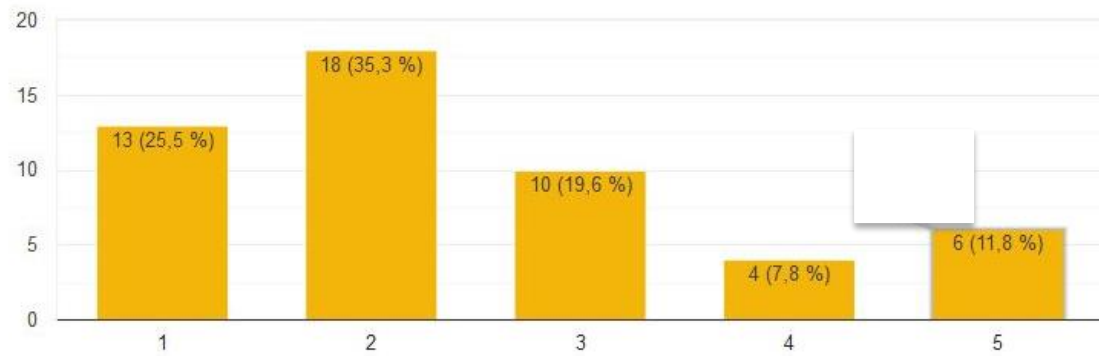
All in all, the surveyed figures on this question in all three countries show that there seems to be too few possibilities of playing games with classmates in school. This, in turn, limits directly the competencies of students with regards to digital media literacy.

The next statement asked the students directly, to which extent they think they could improve their knowledge and competences about digital media literacy. The scale was set up from 1 (strongly disagree) to 5 (strongly agree).

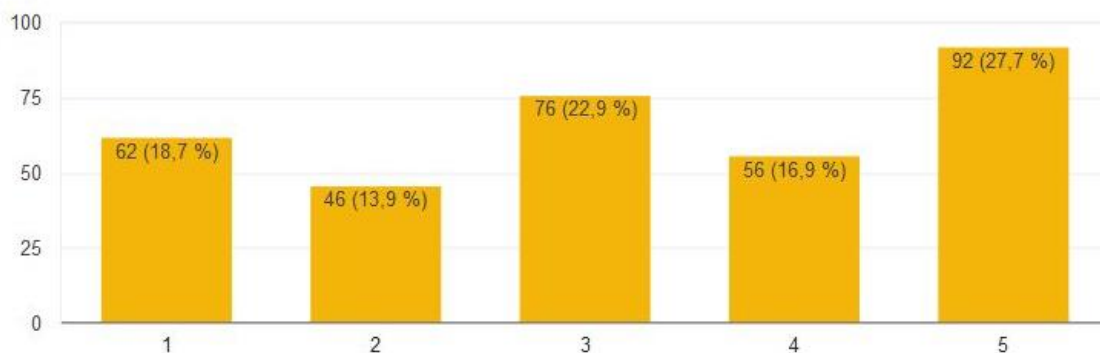
In Austria, 29 of all surveyed students strongly agree with this statement. The same percentage of students (28.2%), chose number 3 on the scale, which can be interpreted as they neither strongly disagree nor strongly agree. In contrast, 23 of them (22,3%) strongly disagree that they could improve their knowledge and skills. All in all, the figures for Austria are quite controversial and show that several students seem not to be fully convinced of their improvements of skills and knowledge, while others are sure that they have made good progress or have not made any progress.



The figures for Malta show a different picture: 13 students (25.5%) strongly agree with the statement, while only 6 (11.8%) strongly disagree with it. The highest number of students (35.3%), chose option “2” on the Likert scale, which can be interpreted as a general agreement to the statement. This leads to the fact, that over 60% of the students agree, or strongly agree, that they could improve their knowledge and digital literacy competencies while playing. The remaining 10 students (19,6%) chose label “3 - neutral” on the scale.



In comparison to Austria and Malta, the surveyed figures for Greek students are rather different. Most students (27.7%) strongly disagree with the statement. 76 students (22.9%) chose a neutral response whereas more than 65% of all students do not agree or even strongly disagree, that playing these games improved their knowledge and digital media literacy skills. Finally, only 18.7% of the students strongly agree to the statement.



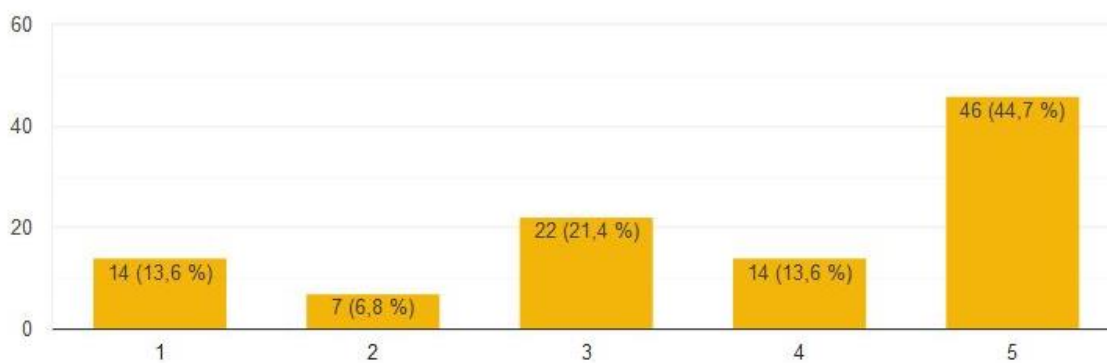
The students indicated that the only competences which are trained is researching over the Internet. It just aims to gain factual knowledge but there is no interaction between the students. The only interactive digital media they use are quiz games. But it is also controlled and depended on the teachers' engagement.

Out of these variety of surveyed figures in the three countries, there are several questions which can be asked. For a more specific interpretation, it would for example be necessary to know more about the general possibilities for students for building digital media literacy competencies in schools in their corresponding countries (Malta, Greece and Austria). It is evident from the responses collected that the students have different starting positions for improving their knowledge and skills, as maybe also different expectations according to their daily experiences in school.

4.4 Providing students tools to deal with unprecedented everyday real-life problems in a creative and responsible manner

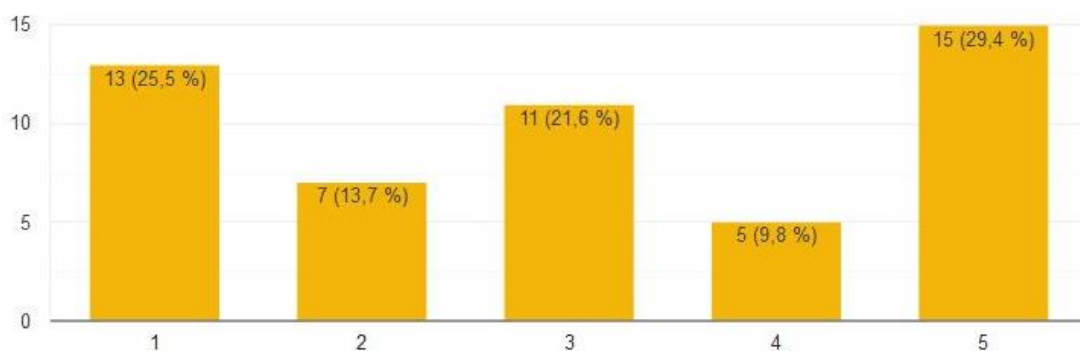
Basing our method on the eCrisis IO5 strategy we included questions that focused on the ways the tools help students to deal with unprecedented everyday real-life problems in a creative and responsible manner. For the first statement which was phrased as “During the workshop I played with classmates I am not used to play normally” the students had to think about their gaming partners.

In Austria, 46 students (44.7%) did not have contact with classmates they are not used to play normally. This leads to the interpretation that students preferred playing with their mates or friends, who they are accustomed too. This interpretation gets verified when looking altogether at the figures for Likert labels 3, 4 and 5: Around 79% of all surveyed students show insecurity or even a strong disagreement to that statement. Only 14 students (13.6%) reported that they have experienced playing with a classmate they are not accustomed to play with normally.

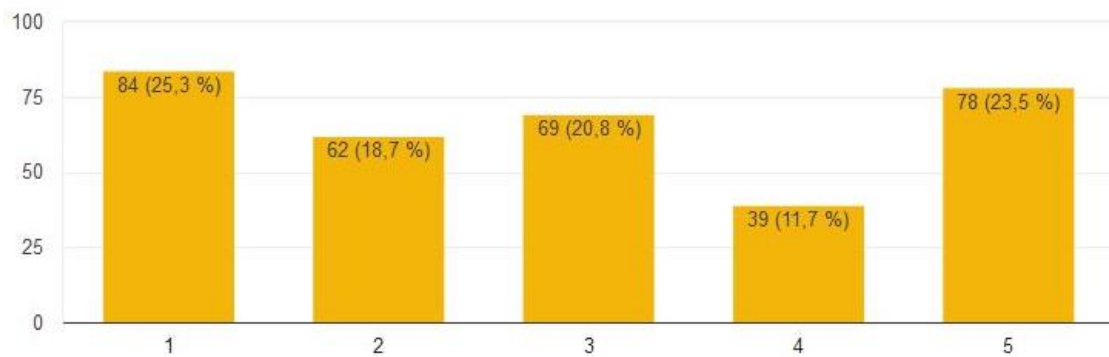


The students’ evaluation provided us with some interesting findings as the responses of the students are not reflecting (or even remotely aligning to) the teachers’ opinions during the interviews. Two teachers reported surprised that two particular students were playing with each other as they normally have a conflicted relationship. On the other side, one teacher verified that the majority of the students’ responses.

The surveyed figures in Malta show a greater variety: while 13 students (25.5%) strongly agree with the statement, 15 students (29.4%) strongly disagree with it. The third highest number of students provided a neutral response (3 on the Likert scale). Even if most of the students strongly disagree, there are also around 40% of students who experienced playing with classmates they are not used to play normally.

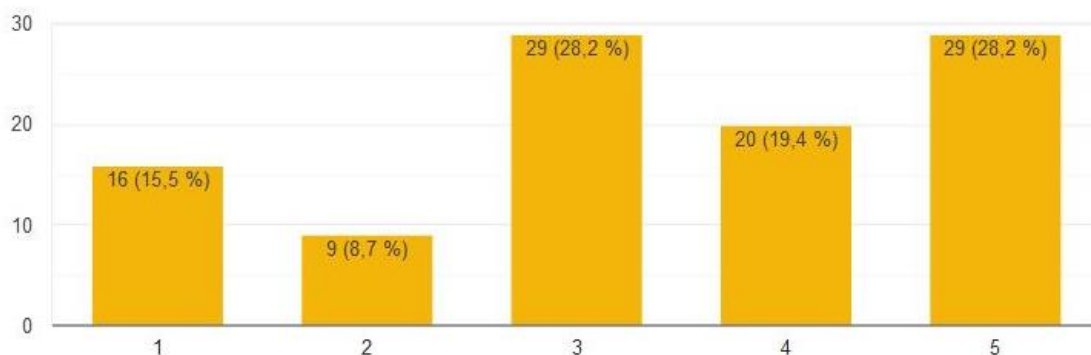


In Greece, the highest number of students (25.3%) strongly agree with the statement. On the contrary, a similar percentage of students (23.5%) strongly disagree that they played with a classmate they are not normally accustomed to play with. In between these extreme values of the Likert scale, 69 students (20.8%) chose label 3 on the scale, which can be interpreted as either strongly disagree or strongly agree. Overall, 44% of the surveyed students agreed or even strongly agreed to the statement, while 35% did not agree or even strongly disagreed with it.



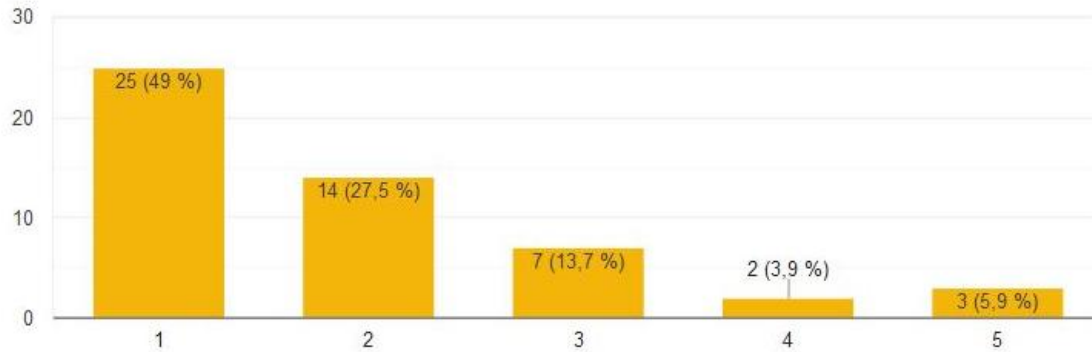
The second statement dealt with the improvement of skills for finding creative solutions; the statement was as follows “The workshop activities helped me to find creative solutions.”

In Austria, most of the students showed uncertainty or even disagreement to this statement: 29 of them (28.2%) chose label 5 on the scale (strongly disagree) and the same number of students (28.2%) chose label 3 on the scale (neutral). The third highest figure can be seen for agreement (label 4). To summarize, most students in Austria do not seem to have experienced the workshop as helpful for finding creative solutions. However, 25 students agreed and strongly agreed to the statement and found the workshop helpful in that regard.

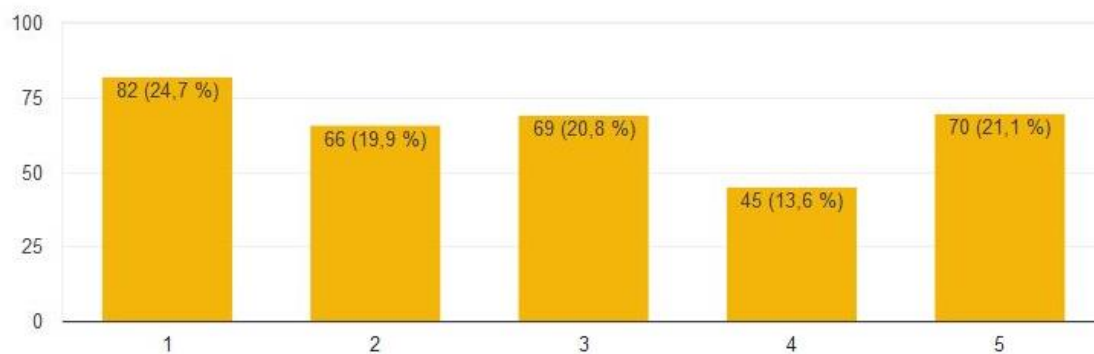


In the interviews, the students pointed out that there is no space for creativity as the class is designed very unilaterally, it is teacher driven and individual tasking. The students reported that they have no opportunity to include their own ideas or needs. Importantly, all students stated that communication between peers is not possible even when they express such wishes.

The surveyed figures for Malta show a contrary picture: The highest number of students (25 students; 49%) strongly agree or agree (14 students; 27.5%) with the statement and experienced the workshop helpful for finding creative solutions. Overall, around 76% of all surveyed students in Malta perceived the eCrisis workshop activities helpful for finding creative solutions. Only 2 students (3.9%) could not agree and 3 students (5.9%) strongly disagree with that statement.



Finally, in Greece, the highest number of students (82 students; 24.7%) strongly agreed to the statement. On the contrary, 70 students (21.1%) strongly disagreed with the statement. The third highest number of students (20.8%) chose neutrality over this statement. Overall, around 44% of the surveyed students in Greece agreed or strongly agreed to the statement, while around 34% of them disagreed or strongly disagreed.



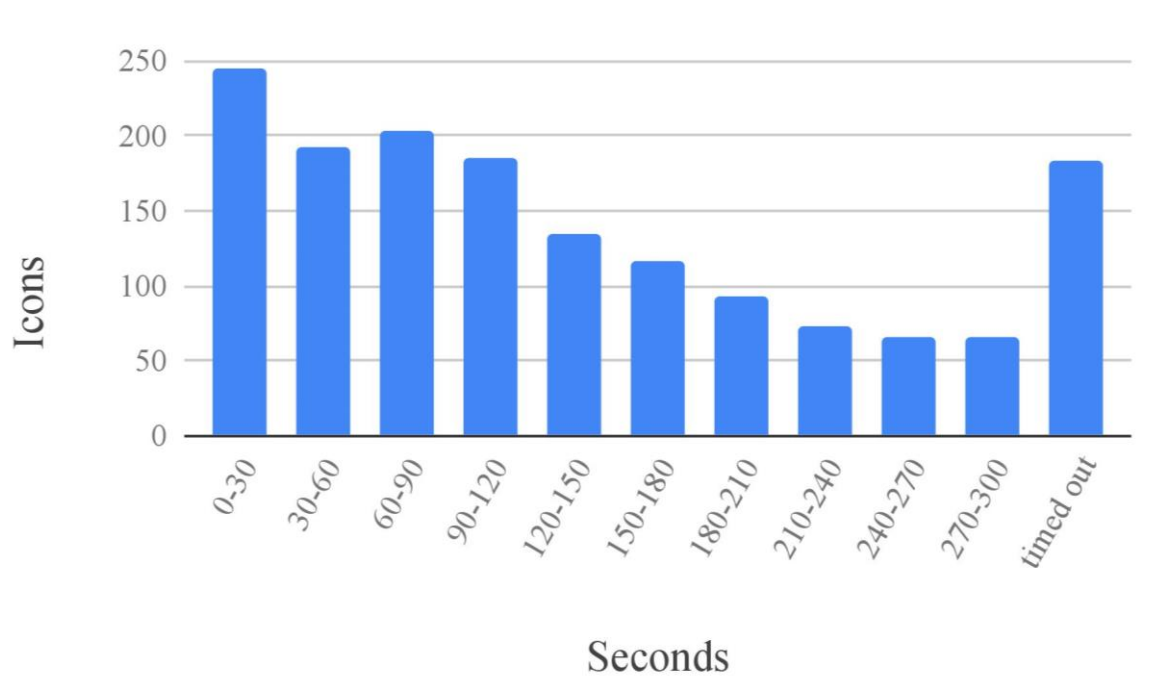
To deepen the survey, the students were also asked to note what exactly helped them to find creative solutions during the workshop. Some indicative responses include:

- The game Iconoscope (choosing the subject, drawing the subject, using shapes)
- The possibility of playing in groups
- The possibility of discussing with classmates while playing
- The possibility of asking workshop leaders for help
- The free choice for board or digital games
- The exchange of information (i.e. about the rules) with friends and classmates

Again, the variety of possibilities for making free choices while playing were experienced as very helpful for finding creative solutions. Interestingly, students mainly focused on finding the

solutions on their own or in exchange with mates, instead of being dependent on their teachers help.

The next section details with outcomes of surveyed in-game-data of the eCrisis games. Iconoscope aims to the ambiguity of creating an icon which represents a specific chosen triplet. The following figure shows how much time the students needed to fulfil the task to create the icon. It shows the relation between time investment and task resolution.



Nearly, 250 icons were created by the participating students within the first 30 seconds. This the most frequent amount of time students needed to fulfil the task. Approximately, 200 icons were created between 60 and 90 seconds. This is the second highest amount of time. The longer the time passed by, the less icons were created. This descending order can be seen in the frequency diagram above. On the contrary, there are around 175 icons which could not be finished on time. It seems that time window of 5 minutes was too short for some students to draw and complete an icon for a particular triplet.

5. Exploitation Plan and eCrisis Outputs

The exploitation plan shows all activities which were held across the three years of eCrisis in all participating countries. The heavy involvement of all users, especially teachers and students, underlines the project intention of

- the active participation of users in learning and assessment activities and validation of training activities.
- facilitating the project outputs' user acceptance and ownership.
- affirming the project's impact more widely and beyond the end of the project.

ORGANISATION	DATES	ACTIVITIES	TEACHERS	STUDENTS	OTHER
Austria					
Department of Education, Vienna, Austria	1.9.2016	Kick-off Gaming Workshop	0	14	5
Private School of Education, Linz, Austria	21.10.2016	eEducation Conference	0	0	25
HBLA Oberwart (Burgenland, Austria)	1.12.2016	Workshop in school	1	19	0
HBLA Oberwart (Burgenland, Austria)	07.12.2016	Workshop in school	1	16	0
Department of Education, Vienna, Austria	9.12.2016	policy makers meeting	0	0	1
ZIS School (school for students with special needs)	13.01.2017	Workshop in school	1	11	0
Department of Education, Vienna, Austria	17.02.2016	Village Voices Event	1	22	0
HBLA Oberwart (Burgenland, Austria)	21.2.2017	Interview	1	0	0
ZIS School (school for students with special needs)	22.02.2017	Interview	1	0	0
Integrative Lernwerkstatt Brigittenau (Wien, Austria)	22.02.2017	Interview	1	0	0
University of Vienna	31.03.2017	E4	0	0	32
HBLA Oberwart, Austria	21.01.2019	Workshop in school	1	12	0

HBLA Oberwart, Austria	21.01.2019	Workshop in school	3	25	0
ZIS 18	23.01.2019	Workshop in school	2	9	0
ZIS 18	23.01.2019	Workshop in school	2	11	0
HAK Wien 10	26.01.2019	Workshop in school	1	4	0
Gymnasium Rainergasse	30.01.2019	Workshop in school	1	19	0
Gymnasium Rainergasse	30.01.2019	Workshop in school	1	25	0
Caritas Lanzendorf	08.02.2019	Workshop in school	1	11	0
University of Vienna	28.02.2019	E7	14	6	19
University of Vienna	13.06.2019	E8	17	27	50
Greece					
Ellinogermaniki Agogi (EA)	15.11.2016	Interview with primary school teachers	3	0	0
Ellinogermaniki Agogi (EA)	18.11.2016	Interview with primary EA teachers	2	0	0
Ellinogermaniki Agogi (EA)	19.11.2016	Interview with the head teacher Secondary school at Lavio, Attiki, Greece	1	0	0
Ellinogermaniki Agogi (EA)	02.12.2016	Workshop with primary EA teachers	5	0	0
Ellinogermaniki Agogi (EA)	05.12.2016	Workshop with primary and secondary school teachers,	34	0	0

		Gymnasium Peristeri, Athens, Greece			
Ellinogermaniki Agogi (EA)	24.11.2016	Workshop with social sciences university staff and 1st year pre-graduate students studying Games and Communication Panteion University	3	44	0
Ellinogermaniki Agogi (EA)	07.12.2016	Interview with advisors at the Institute of Educational Policy	2	0	0
Ellinogermaniki Agogi (EA)	12.12.2016	Workshop with university staff and students	1	14	0
NTUA	July 2017	Course on game design and development	0	15	0
NTUA	July 2017	Presentation to game devs during Game Jam	0	3	35
NTUA@Univ. Piraeus Master's programme	October 2017	Teacher training event	23	0	0
NTUA	November 2017	Presentation to general public	0	0	35
NTUA	January 2018	Concertation with iRead H2020 project	0	8	15
NTUA@Doukas school	March 2018	Presentation on GBL	120	35	30
NTUA	June 2018	Lecture on GBL	0	18	0
Ellinogermaniki Agogi (EA)	July 2018	C2	25	0	0

NTUA@Univ. Piraeus Master's programme	October 2018	Teacher training event	18	0	0
Ellinogermaniki Agogi (EA)	November 2018	Teacher Training Workshop, EA Primary School	10	0	0
Ellinogermaniki Agogi (EA)	November 2018	Pilot courses in EA Primary School	7	170	0
NTUA	28.06.2019	E6	5	0	5
Ellinogermaniki Agogi (EA)	January 2019	Teacher Training Workshop, EA High School	4	0	0
Ellinogermaniki Agogi (EA)	February 2019	Pilot courses in EA High School	3	162	0
Malta					
Institute of Digital Games	October 2016	E1	15	10	0
Institute of Digital Games	March 2018	E2	15	10	0
University of Malta	March 2018	C1	25	2	0
St Ignatius College	10.04.2018	Professional Development Session for Staff Members	160	0	0
Ministry of Education, Malta	July 2018	Teacher training Event in Valletta	25	0	0
University of Malta	February 2019	Primary School Workshops	6	75	0
University of Malta	February 2019	Google Developers Group - Gamification talk	0	30	0

University of Malta	March 2019	School Visit	2	25	0
St Ignatius College, Malta	May 2019	E5	40	0	0
University of Malta Feat. Ministry of Education (Stephen Bezzina)	March 2019	Visits in Schools - St Ignatius College Fandaq Middle School	70	0	0
Science in The City, Valletta	September 2017, 2018, 2019	Dissemination events	0	100+ 100+ 100+	NA
St Ignatius College	March-August Period?	School evaluations	7	51	0
University of Malta	December 2018	GaLa Conf.	0	0	100
University of Malta	May 2018	AI and Games Summer School, Chania, Greece	0	0	100
University of Malta	May 2019	AI and Games Summer School, New York, US	0	0	65
University of Malta	July 2018	Deep Learning Summer School	0	0	1000
University of Malta	June 2018	CEBIT, Serious Games Conference	0	0	300
University of Malta	May 7, 2019	Presentation of Game AI at NCSR-Demokritos	0	0	200
University of Malta, NTUA	Nov 2019	GaLa conference, Athens	0	0	100
University of Malta	June 2019	Invited talk - Prof. Yannakakis, TU Eindhoven. Co-located event	0	5	20

		with the Com N Play H2020 Project			
University of Malta	July 2019	Global Game Jam Next (for Kids) - In collaboration with the Com N Play Science H2020 Project	5	10	0
University of Malta	July 2019	Prof. Yannakakis delivers a tutorial on <i>AI and Games</i> at ACAI Summer School, Crete, Greece	0	0	90
Total			690	1208	2227

As in the table above can be seen 685 teachers, 1208 students, and more than 2222 other stakeholders were involved in the eCrisis activities.

In Austria, digitalisation in education is of main interest to the Austrian government and remains one of the main issues in teacher training and qualification as well as educational policy debates. The Viennese consortium has expanded its network within university, schools, and with out-of school stakeholders. The network of teachers interested in discussing the issue of digitalisation and inclusion further has expanded. Activities to continue dissemination activities have already been started.

In Malta, the eCrisis dissemination and outreach activities have expanded the network of key stakeholders with an interest in game-based learning for soft skills learning and beyond. These include: key EU project partners from the H2020 *Envisage* and *Com n Play Science* consortia, partners from the upcoming *Learn to Machine Learn* Erasmus+ consortium, the Ministry of Education, the Ministry of Digital Economy and Innovation, Gaming Malta, game development and AI companies across the country (such as Dorado games) and a number of private and public schools beyond the eCrisis consortium. The expansion of the eCrisis network for exploitation purposes is further detailed in the next section. The designed eCrisis games will be accessible online for at least 2 more years after the conclusion of the project thus enabling new opportunities for exploitation within schools (and informal educational settings) in Malta and beyond.

In Greece, the project is continuing its efforts to disseminate the messages and results of eCrisis widely in the world of school education. At the level of policy making, through EA's established collaboration with the Institute of Educational Policy of the Greek Ministry of Education in the "Open Discovery Space" (ODS), "Inspiring Science Education" (ISE) and "Open Schools for Open Societies" (OSOS) projects, eCrisis is promoted as an approach and

toolbox for the development of innovative learning activities in Greek schools and beyond, linked to policy lines and priorities including the use of ICT in education as well as citizenship education and inclusion. In addition, at the level of every-day education practice, making use of EA's very strong networking with schools and teachers in the context of several projects, the outreach efforts of eCrisis will continue addressing large numbers of education practitioners and school communities.

6. The Europe In Crisis Network

The eCrisis Network shows participants, institutions, organisations and projects which gradually got heavily interested in the eCrisis project and its outcomes. The idea behind this network was to offer staff training assignments in the form of job shadowing for future Erasmus+ staff mobility projects. Second, the network will be a basis of a further Horizon Europe (FP9) and Erasmus+ proposals in the areas of game-based learning and soft skills training. The Institute of Digital Games, University of Malta, as the coordinating partner of eCrisis maintains an emailing list (respecting all GDPR issues) of the below stakeholders which are informed about any future developments of the project such as new evaluations, outreach activities, new game versions, or exploitation plans of the project.

Country	Affiliation	Name
Malta	KOPIN	Marianna Coletta
	Ministry of Education	Stephen Bezzina
	St Katherine's School	Gabriella Govus
	Naxxar School	Bernardo Riolo
	Education Officer (Diversity: Learning to Learn & Cooperative Learning)	Scicluna Bugeja
	St Thomas More College	Clara Agius, Daniela Ellul
Austria	Vienna school board	Rupert Corazza
	Bundesministerium für Bildung, Wissenschaft und Forschung (Ministry of Education)	Stephan Waba
	Schule im Aufbruch	Ingrid Teufel
	Selbstvertretungszentrum Wien (Center for Self Advocacy)	Iris Kopera

	Caritas Lanzendorf	Iris Grasel
	HBLA Oberwart	Resi Schmall
	ZIS 18 (Center for Inclusive Education)	Andrea Schweiger
	Ovos	Nicole Salomon
	Gymnasium Rainergasse	Markus Resch
	KPH Wien/Krems	Sonja Gabriel
	University of Münster, Germany	Katja Driesel-Lange
	University of Darmstadt, Germany	Benedikt Pielenz
	University of Basel, Switzerland	Elena Makarova
	University of Vienna	Fares Kayali
	Technical University of Vienna	Matthias Steinböck
Greece	Institute of Educational Policy, Ministry of Education	Georgia Fermeli
	State Scholarships Foundation, Erasmus+ National Agency	Fani Stylianidou
	Computer Technology Institute and Press "Diophantus" (the ICT research and technology organization of the Ministry of Education)	Georgios Mylonas
	University of Athens - Department of Early Childhood Education	Iro Voulgari
	University of Piraeus - Postgraduate programme in e-learning	Simos Retalis
	Panteion University	Elina Roinioti
	British Council Greece	Anastasia Andritsou

It is important to note that beyond the Network of stakeholders indicated above the project will maintain the reports and game toolbox, and eCrisis guidebook accessible, and social media accounts and pages active (FB, Twitter) for several years to come. Such a strategy will enable a higher participation of new partners interested in the eCrisis outcomes and guarantees the use of the eCrisis outcomes in future classrooms.

7. Summary and Conclusion

The evaluation IO5 covers all outcomes of the eCrisis project within three years of running. The participatory research approach offers a grounded and detailed picture of playful activities in Austria, Greece and Malta.

To conclude the surveyed quantitative and qualitative figures, it became clear that students and teachers did not experience the workshops in the same way and show different opinions on specific topics.

In all three countries, the cooperation between peers worked out well. With regards to creative thinking, they experienced a creative way of learning. Normally, they are not used to deal with creativity in class. The game Iconoscope helped them to reflect on creativity and offered the possibility to work together, which was very important for them. The fact that the game Village Voices could only be played in cooperation was mentioned a lot by the students as well. Even if they had problems and conflicts, they enjoyed finding creative solutions collaboratively. The students described the game Iconoscope as confusing in the beginning, but most of them managed to find solutions and fulfill the tasks. One remarkable output is that the students felt limited in their creative process while playing Iconoscope. This is for example related to the game design which provides a certain range of colors and forms. Also for Village Voices the students mentioned some innovative and creative improvements. Especially when barriers occur, which could lead to social exclusion, students in all countries shared their improvements in the reflective debate with us. According to the participating teachers, the implementation of games in classes is limited because of a lack of resources like money, time and their own media competencies. All teachers pointed out their will to attend further teaching trainings to improve their skills and knowledge.

In general, there is a big variety in the students' perceptions. Austrian students experienced that the eCrisis methodology does not help them to deal with particular aspects of soft skills learning. In Malta, students were not sure if the games are helpful or not for conflict resolution. In contrary to Austria, the Greek students agreed or strongly agreed with the statement that the workshop activities helped to deal with conflicts. As a general fact, all students pointed out that cooperation and collaboration is essential for finding conflict solutions. Overall, however, eCrisis helped them to view playful activities as a method to deal with conflicts and resolve them. Such a finding can be verified by the teachers' statements who try to offer playful activities to foster class community and social inclusion.

To summarize the surveyed quantitative and qualitative figures, all asked students made clear that eCrisis methodology helped them to discuss with peers. Furthermore, they mentioned that the Workshop offered them a lot of space to choose and participate, as well as to discuss with their classmates. The interventions of authorians were limited and students experienced

themselves as competent and self-advocated when it comes to finding solutions. In contrast, some teachers argued that the workshop frame was not guided enough and experienced the students as disoriented. Hereby, it can be seen that students and teacher's perspective and perception are not congruent. Also, the traditional teaching style implies a strict hierarchy between teachers and students. On the other hand, an interactive playful teacher style turned out as pleasant for the students.

The eCrisis IO5 project report closes with a collection of stakeholders and potential collaboration aspects for the future. As the project results show teaching attitudes and technical barriers might still foster social exclusion. Students enjoy playing games and even improve their skills and knowledge, especially when it comes to solve conflicts and find solutions for everyday problems.

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List of Figures

Figure 1. Evaluation strategy

Figure 2. Model of stages of participation (von Unger 2014, 40; translated by the authors)

Appendix

Problem-centred interview questions (students)

1. How did you experience the workshop and the community life in class? Did you notice any differences according to normal class?
2. Which conflicts do appear in your class? How are you going to solve it?
3. Are there different ways to solve/fulfil tasks in class? If yes, which one do you notice, or which one do you use? Do you like it to work creatively?
4. How do you debate in class? Do you reflect on your debates and your classmates the ideas/opinions?
5. Do you think that the eCrisis games could help you to foster the community life in class? If yes, how did the games effect it?
6. To what extent are you taught about using tablet or computer games in class?

Students questionnaire

In which country do you live?

- Greece
- Malta
- Austria

Gender

- Male
- Female
- Diverse

Age: _____

Do you enjoy playing computer games?

- Yes
- No

Are you used to play computer games in groups?

- Yes
- No

Are you used to play computer games in class?

- Yes
- No

Could you list the good points and the bad points of the eCrisis games? Please justify your answer.

Please indicate to what extent you agree with the following statements.

I managed to cooperate with my classmates while playing the games.

Strongly agree 2 3 4 5 Strongly disagree

I could improve my knowledge and my competences about digital media literacy.

Strongly agree 2 3 4 5 Strongly disagree

During the workshop I played with classmates I am not used to play normally.

Strongly agree 2 3 4 5 Strongly disagree

The workshop activities helped me to find creative solutions.

Strongly agree 2 3 4 5 Strongly disagree

Which activities did help you to find creative solutions?

The workshop activities helped me to deal with conflicts.

Strongly agree 2 3 4 5 Strongly disagree

Which activities helped me to deal with conflicts?

The activities helped me to discuss with my classmates.

Strongly agree 2 3 4 5 Strongly disagree

Which activities helped me to discuss with my classmates?

Field Notes Sheet

Field notes	Observation protocol
<p>General</p> <p>To what extent are the students immersed in and do parts of the activities addictively?</p> <p>To what extent are the students taking risks and leave his/her comfort zone?</p> <p>To what extent are students coming up with surprising ideas?</p> <p>How do students exhibit awareness of and concern/interest for the impact of new ideas on the group's values?</p>	

<p>Interaction and communication</p> <p>How do students generate, explore and enact new ideas with valuable community impact?</p> <p>How do students pose questions with and for others?</p> <p>How is the interaction when a teacher is present?</p>	
<p>Dealing with problems</p> <p>Which dilemma/questions/issues appear within the interaction?</p> <p>How do students deal with the consequences of their decision making?</p>	
<p>Conflict solution</p> <p>How do students find ways to negotiate conflict or to go in different directions if conflict not resolved?</p> <p>Which workshop activities foster the conflict management?</p>	
<p>Creative thinking</p> <p>Which workshop activities foster creative thinking?</p> <p>Which strategies are used to solve/deal with conflicts?</p>	
<p>Reflective debate</p> <p>How do students debate between ideas, respects different viewpoints and/or encourages members of the group to voice their ideas?</p> <p>Which workshop activities foster reflective debating?</p>	
<p>Dealing with media</p> <p>To what extent do the students have digital media literacy competences?</p> <p>Do these competences enough to play the eCrisis games?</p> <p>If not, do the games support the students to forster their digital media literacy competences?</p> <p>Is there a collaborative interaction while playing?</p>	