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eCrisis: "Europe in Crisis"

IO1 eCrisis Framework

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Executive Summary

The key objective of this report is to examine the problems emerging across Europe in school communities and societies, such as refugee exclusion; European debates—relating to economic crises—that imply cuts to spending on education, and bullying.

List of abbreviations

Abbreviation	Definition
UOM	University of Malta
UNIVIE	University of Vienna
EA	Ellinogermaniki Agogi (Greece)
NTUA	National Technical University of Athens
SIC	St Ignatius College
IO	Intellectual Output

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1. Introduction

The key objective of this report is to examine the problems emerging across Europe in school communities and societies, such as refugee exclusion; European debates—relating to economic crises—that imply cuts to spending on education, and bullying. These challenges will here be examined with the help of 21st century skills of conflict resolution, and with an eye to creative problem solving. Specifically, we shall suggest that game-based activities may provide one such solution in primary and secondary school education. This report provides a framework for the eCrisis project: one by which teachers, students, refugees, and people with learning difficulties and disabilities can address recent societal challenges, and are able to reflect on these challenges in a creative fashion that informs the training of social soft skills.

The framework reports on the outcome of:

(i) State of the art review: Review on **inclusion** and the use of conflict resolution, creative thinking, reflective debate, best practice, and current research on recent **games for inclusion** that engage with the socio-economic challenges in Europe and look at its impact on primary and secondary school education. Moreover, mapping of **conflict resolution, creative thinking, reflective debate** theories and practices, and **educational scenarios** is provided.

(ii) Findings from Reflective Workshops and interviews: These entail the (user) requirement analysis of target groups, including definitions of specific skills and competences needed to integrate conflict resolution and creative problem solving through game-based learning in the daily teaching practice. Findings from the workshops and interviews

- Elaborate on the schools and institutions of **key stakeholders** and train these in eCrisis aims. A small group of educators, students, refugees, and people with disabilities (5-7 stakeholders per country) and their institutions are involved as the main drive of the community-based requirement analysis and in all key eCrisis activities.
- Expand on current **societal challenges** in schools. Key stakeholders frame the core pedagogical scenarios for conflict resolution, creative thinking, and reflective social debate that can be realized through games that directly address the current and future societal challenges of schools.
- Elaborate on **user requirements** for greater accessibility, as well as additional **scenarios** that can be authored and gamified (Deterding et al. 2011) within the eCrisis game-based learning Toolbox (for O2).
- Shed light on the necessary background required for teacher training (for O3 and O4), specifically **aims, sets of attitudes, technologies**, and **teaching scenarios**.
- Expand on appropriate **inclusive research methods** based on quantitative and qualitative analysis for wide use of game-based learning in soft skill training across Europe (for O5).

2. Social Inclusion, Games and Education

The definition of social inclusion is strongly connected to its antonyms exclusion and integration. Therefore, this complex issue will be introduced by illustrating a model of different societal- and school systems. These systems are all present in most European countries in various degrees and combinations, although the ratification of the UN Convention on the Rights of Persons with Disabilities (UN 2006) now makes inclusion a legally binding goal. It is important to note that these models can be interpreted from both inside(r) and outside(r) perspectives.

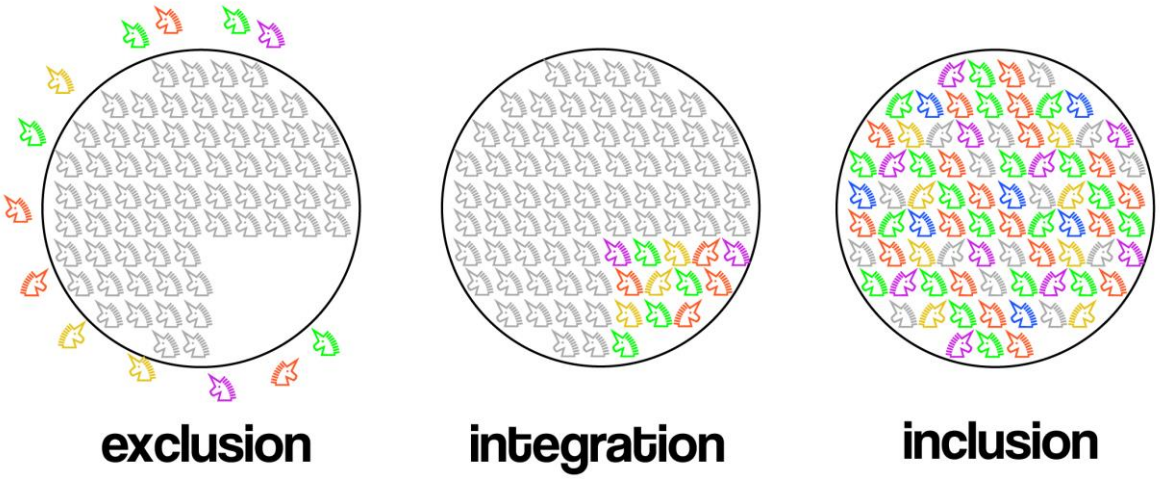

Figure 1. Inclusion - Exclusion Model

The model on the left—denies access to specific groups not considered to be part of society. The second model—integration—illustrates efforts to include certain groups of people not originally identified as part of the community. Integration typically still entails certain levels of exclusion, be it through spatial segregation or exclusion from specific activities. Finally, inclusion aims to realize the principle of full participation, and points towards equal access at all levels. We shall turn to what it could mean—as well as what it actually means—later on.

The European Commission Department of Employment, Social Affairs and Inclusion defines "active inclusion" as follows: "active inclusion means enabling every citizen, notably the most disadvantaged, to fully participate in society, including having a job" (European Commission 2016). Support in the form of out-of-work and in-work benefits might help enable access to inclusive labour markets. In addition to tackling social exclusion, a focus on work environments serves to avoid poverty; motivation-loss at work; long-term unemployment; gender inequality, and labour market segmentations (European Commission 2016). In summary, the European Commission defines inclusion mainly through employment-related opportunities of participation while promoting an active and practical model of inclusion that aims to prevent social exclusion (Stewart et al. 2013, 16). Following the definitions of the same authors as mentioned above, social exclusion—the antonym of social inclusion—is defined as a process that pushes people to the fringes of society, denying a person's right to fully participate in it,

mainly due to poverty and/or unemployment. This can result in a lifelong lack of exposure to learning opportunities and, consequently, a lack of basic competencies. For this group of people, employment, educational opportunities, social participation in general, as well as networking opportunities edge increasingly out of reach. Discrimination and public policies that result in economic poverty are contributing factors to social exclusion. (Stewart et al., 2013, p. 15).

In general, the Protection Policy (EU Council 2010) encompasses factors such as labour, health, housing, and lifelong learning. These policies, aimed at increased social inclusion, focus on empowering individuals to overcome social exclusion with governmental support (Stewart et al. 2013, 16). Since social inclusion and empowerment are complex and multifactorial processes, the success of any particular process depends on the individual and his/her specific needs. The core aim is for individuals to gain "control of their lives through development of capabilities and capacities, including skills, social capital, wellness, self-confidence and self-advocacy, which in turn are built up through civic participation, work and education." (Stewart et al. 2013, 169)

In addition to the definitions described above, the authors of this framework utilize a broader approach to social inclusion, which covers more aspects than participation and employability in the labour market, and the associated restrictions to social life. John O´Brien's (2014) expanded definition is as follows:

> *Inclusion is an emergent property of a particular situation in which everybody takes responsibility for claiming the right to be part of a diverse community of equals. It is a social creation for which everyone engaged in a common project holds responsibility. Inclusion benefits and challenges everyone involved. Everyone grows and learns in proportion to their engagement and openness.* (O´Brien 2014, 9)

Following this approach, social inclusion addresses everyone in the community: everyone has the responsibility to foster and improve a communal life that allows all of us to live and participate. Participation should not be dependent on ability, as this mechanism leads to exclusion in its close association to disability (defined here as the restriction of participation due to a broad societal focus on the ability to be especially economically self-sufficient and independent). However, social inclusion delivers the necessary opportunities and resources to enable individuals to fully participate in society (Bleumers et al. 2012, 14).

Against the backdrop of these considerations, social inclusion shall now be approached according to the aims of the eCrisis-project, which is influenced and framed by a number of challenges (such as refugee discrimination, and economic or individual everyday crises),

currently facing the European Union and its individual member states. All of them are related to social inclusion and lack of participation.

2.1. Inclusion and Participation

The following chapter deals with the inclusion of marginalized groups in school communities via game-based learning—the main goal of the eCrisis-project. Inclusion of the groups mentioned is also fundamental to the research process itself (and will be extensively described in the "evaluation"-section). Nevertheless, a short introduction to inclusive research at this early stage of the framework seems necessary, as it will lead us through every step of the research process as well as introduce our approach to inclusion.

Koenig (2011, 214) describes inclusive research as research *with* marginalized people instead of *on* or *about* them, and this approach was adopted and applied in the methodological framework at every step of the eCrisis-project. We have used the American model of community-based participatory research, as well as others (von Unger 2014, 2). Israel et al. (1998) address how "community-based research offers a means to reduce the gap between theory, research and practice that has been problematic [...]" (Israel et al. 1998, 194), according to the exclusive situation of marginalized people in (school-) communities. Von Unger (2014, 4f.) additionally lists some advantages of participatory research:

- the research questions are designed to relate to the real problems of the marginalized community
- The reliability, validity and the cultural sensitivity of the research process are improved by the participating people
- A higher level of trust between researchers and the involved community members can be achieved
- The interpretation of results can be more effective and sensitive

After this short introduction, it is necessary to define key competences for social inclusion, both on the side of researchers as well as on the side of participants, as these are central to the eCrisis-project.

2.2. Key Competences for Social Inclusion

The eCrisis project aims towards the realization of inclusive education that will fully engage in the strengths of game-based primary and secondary school learning and teaching to foster the development of social, civic, and intercultural competences such as conflict resolution, creative thinking, and reflective debate, as well as digital media literacy. This will help empower European children to develop into responsible citizens and creative solvers of the unprecedented everyday real-life problems arising in the context of Europe's multiple crises.

2.2.1. Conflict Resolution

Coping with and confronting conflicts is part of social life. Indeed, conflicts seem to arise in almost every context and developmental stage of human life—from schoolyard scuffles, to bullying in the workplace, to international warfare. While the question of whether or not conflicts are inevitable is disputed, there is widespread agreement that the current prevalence of conflicts and the associated (lack of) resolutions is incurring substantial cost to society at large (Ting-Toomey 2001; Weaver 2000). The personal and collective gains that follow conflict resolution have motivated scholars in the fields of law, education, organizational management, psychology, and social science, among others, to advocate the use of pro-social mechanisms for resolution (Exline et al. 2003). Interventions that may give individuals experience in conflict resolution will be of clear benefit to society.

A complex web of societal structures, technological advances, and developmental processes call for immediate action on the problem of conflicts. On the societal level, as European countries become increasingly multi-cultural and ethnically diverse (Husband 2007), integration has grown more problematic due to clusters of cultural and ethnic groups naturally forming in major urban centres. Clashing social dynamics often emerge in these areas, which, in turn, affects the wider European social dynamics. Theoretical frameworks provided by sociology, anthropology, cross-cultural psychology, and intercultural communication can only go so far in providing solutions, and are impeded in no small part by the ever-changing patterns of immigration flow and the different structural formations of conflict that can occur, whether it be individual-individual, individual-group, or group-group. On a technological level, the advances of modern society pose new dangers to an already vulnerable group: children. Children of "Generation Y" are growing up in a networked world whose reach branches out beyond the realm of school and into their homes. Not only do young people experience the intrusion of unresolved conflicts in their private spaces (e.g. via Internet or mobile phones), but their perception of harm is further magnified in the context of a youth culture that inevitably seeks the acceptance of the peer group (Livingstone 2009). Despite the efforts of policymakers to respond to these new risks, 5–10% of UK school children are reported to be victims of bullying; another 5% are bullying others (Sharp & Smith 2002). According to the BBC[1], these numbers have grown exponentially in the last decade. On a developmental level, entering the educational environment is daunting for some children. The classroom is the stage upon which learning difficulties, specific learning problems such as dyslexia, anti-social, and deviant behaviour are enacted. Although family dynamics can be the root of many behavioural problems (Margalit & Almougy 1991), the educational system is responsible for reinstating children who have to face these difficulties, and give them the necessary tools to manage their individual needs (Pumfrey & Reason 1995). Some educational systems—such as the Greek one—lack policies that relay clear intervention strategies, and are detrimental to children's integration.

[1] See http://www.bbc.co.uk/newsround/13905962

Our conflict patterns, conflict avoidance, and conflict resolution form at an early age and continue to affect the way we think, guide our behavioural responses, and moderate our personal development throughout our lives (Ting-Toomey 2001). It is therefore advantageous to acquire effective conflict resolution skills as early in life as possible, and ideally before encountering the problems articulated above. Early/Pre- and primary education is the optimal time for teaching conflict resolution mechanisms. Yet, the most recent "best practices" for conflict resolution, adopted by the vast majority of European schools fail to achieve many of their stated objectives. Schoolteachers clearly need improved strategies and tools to identify potential conflicts and to educate students on how to resolve them.

Technology, serious games, and simulations have already proven viable and effective for supporting therapy, promoting intercultural communication, increasing understanding of ethnic-, religious-, and historical conflicts, and representing different perspectives on issues such as global politics and foreign policy. Computer games also stand as strong candidate tools for teaching conflict resolution.

The popularity of computer games is widespread; they have been embraced as a media form by the young generation (Dovey & Kennedy 2006). Further, computer games can work as collaborative spaces. Almost invariably, computer games contain elements of conflict, often between the in-game character controlled by the player and either one or several non-player characters (NPCs), or between characters controlled by a group of human players. In many—though not all[2]—contemporary computer games, violence is the most common method for resolving conflicts. To win the game means that other players or characters have to lose. In contrast to these competitive and retributive models of computer games, engaging and entertaining games whose objective is to overcome obstacles through collaboration with other players in a non-violent way are gaining in status (Voida et al. 2009; Rogers 2006). Instead of rewarding and reinforcing competitive behaviour, this genre of games rewards collaborative and non-violent problem solving. Computer games also directly support a mechanism key to learning: they stimulate student motivation. Classroom lessons are tailored to increase students' intrinsic motivations (e.g. interest, enjoyment, and inherent satisfaction) and extrinsic motivations (e.g. internalizing and integrating the lessons learnt). To that end, games enhance immersion, facilitate critical thinking, and allow for the exploration of different perspectives.

On this basis, we have developed a new type of game—a conflict resolution game (CRG)—called Village Voices (VV), which can only be played together with others, and which can only be won as a group. VV's main objective is to teach players peaceful and constructive strategies

[2] There have been minor elements in commercial computer games (especially the popular massively multiplayer online games like World of Warcraft), where collaboration is a key component, but usually only as a subset of the core game mechanics of violent problem solving.

for conflict resolution; knowledge that can then be transferred to other domains. The players, who can be divided into one or several groups or "sides", face a conflict situation together. The conflict is implemented as a scenario whose domain is appropriate to the interests, maturity, and level of general knowledge of the participants. Each scenario contains one or more goals, which players need to achieve; a number of obstacles, and means for overcoming the obstacles. In terms of game mechanics, these kinds of scenarios can be formalized as collaborative puzzle solving with constraints, where each participant has incomplete information about the overall state of the game (puzzle task paradigms have already proven successful in the context of collaboration (Kraut et al. 2002)). All of these elements will support the learning objectives of the game by immersing players in the conflict, facilitating a critical approach to their assumptions about the conflict, and allowing them to explore new perspectives other than their own. We give demonstrative examples in two domains:

- In a classroom scenario, a group of students jointly work on a math problem for a graded assignment. All members of the group are aiming for the highest grade (goal). One of the students has a learning disability and is unable to contribute on an equal level (obstacle).
- In a home scenario, four family members have to share household tasks amongst themselves such that everyone feels the tasks have been distributed fairly (goal). The varying perceptions among family members of the difficulty and value associated with carrying out each task need to be overcome (obstacle).

2.2.2. Creative Thinking

To define the notion of *creative thinking* we are aligned with the general principles of *lateral thinking* (De Bono 1970) and *creative emotive reasoning* (Scaltsas & Alexopoulos 2013), the latter being an instance and specialization of the former. Lateral thinking (De Bono 1970) is the process of solving seemingly unsolvable problems or tackling non-trivial tasks with an indirect, non-linear, creative approach. The Iconoscope game (see relevant section below)—a core game of the eCrisis framework—realizes the very nature of lateral thinking, which, as a creativity process, is boosted through constrained spaces of solutions (De Bono 1970). Co-creation with computational creators of visual art, content design, and visual concepts encapsulates the very core principles of *diagrammatic reasoning*, since human creativity, and especially lateral thinking creativity, is often associated with construction and the principles of customization (De Bono 1970).

The *random stimulus* principle of lateral thinking (Beaney 2005) relies on the introduction of a foreign conceptual element with the purpose of disrupting preconceived notions and habitual patterns of thought. It does so by forcing the user to integrate and/or exploit the foreign element in the creation of an idea or the production of a solution. Randomness within lateral thinking is the main guarantor of foreignness and hence of stimulation of creativity (Beaney 2005). The creative act is, according to creative emotive reasoning—which enriches

the basic notions of lateral thinking with semantic, diagrammatic, and emotive dimensions—understood as an intervention that results in *re-framing*, where frames can be viewed as systems or established routes that divide the possibility space (e.g. the game design space) into bounded, meaning-bearing sub-areas. On that basis, the random stimulus and the re-framing principles have one element in common: they are *enablers of a change in the lateral path*. The re-framing and the random stimulus principles are embedded in the Iconoscope game as machine creativity (through in-game assistants) and offers heuristically-driven stimuli that are often altered through e.g. mutations within a genetic algorithm, which can, in turn, alter the user's framing on a particular task/problem. An artificial mutation to a visual diagram, an image, or an icon, resembles the random stimulus that can act as a potentiator of creativity and cause alteration of lateral thinking.

To foster creative thinking under the eCrisis Framework, we facilitate the game Iconoscope in the classroom and beyond. For further information on Iconoscope, please refer to section “eCrisis Game: Iconoscope”, below.

2.2.3. Reflective Thinking

In the eCrisis Framework, reflective thinking is considered a competence for social inclusion. It can be defined as a systematic meaning-making process based on a set of attitudes and occurring through social interactions (Dewey 1933; Farra 1988; Rodgers 2002).
The three key aspects of reflective thinking are:

- meaning-making
- systematic way of thinking
- social process

Reflective thinking is a meaning-making process

Reflective thinking stands in close reference to education and democracy. Education is the "reconstruction or reorganization of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience (Dewey 1944, 74)." Reflective thinking is the core driver of such an education, as it gives meaning to experience through value. By “meaning” we here refer to that which “one perceives in and then constructs from an experience that gives that experience value” (Rodgers 2002, 848). Rodgers adds further,

> The function of reflection is to make meaning: to formulate the relationships and continuities among the elements of an experience, between that experience and other experiences, between that experience and the knowledge that one carries, and between that knowledge and the knowledge produced by thinkers other than oneself (Rodgers 2002, 848).

Reflective thinking is a systematic way of thinking

Contrary to beliefs, imagination, and stream of consciousness, reflective thinking is a systematic way of thinking. It follows six phases:

- indeterminate situation and experience
- spontaneous interpretation of the experience
- definition problem(s) or the question(s) that arises out of the experience of routinized actions
- exploring condition and possible explanations for the problem(s) or question(s) posed
- ramifying the explanations into hypotheses
- experimenting or testing the selected hypothesis by action (Miettinen 2000; Rodgers 2002)

Reflective thinking is a social process

John Macmurray has pointed to a simple fact:

> Human personality is constituted by personal relations. It is only through our personal relations that we are human at all… The human individual—out of relation to all other human individuals—is a myth (Macmurray in Fielding 2007: 386).

Dewey (1944) has pointed to a similar process in regards to reflective thinking. First of all, thinking, and articulation of thought, are two different things. Only the act of articulation and expression of thought allows you and others to fully understand your thinking that merely to think without ever having to express what one thought is an incomplete act. He recognized that having to express oneself to others, so that others truly understand one's ideas, reveals both the strengths and the holes in one's thinking: "The experience has to be formulated in order to be communicated" (Dewey 1944, 5).

Reflective thinking is, according to Dewey, "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (Dewey 1933, 9) and it allows people to “transform a situation in which there is experienced obscurity, doubt, conflict, disturbance of some sort, into a situation that is clear, coherent, settled, harmonious" (Dewey 1933, 100) and develops critique towards structural problems beyond oneself.

3. Games for Social Inclusion

Of course, digital games do not amount to a direct intervention for the avoidance of poverty or loss of employment. Nevertheless, they do facilitate learning and empowerment processes such as social participation and communication (Stewart et al. 2013, 16). Thus, gaming, and especially its reflection, opinions, and behaviour, can be reconsidered and new strategies can be found. Accordingly, both our policy and research are oriented towards achieving social inclusion through the use of digital technologies.

There are several reasons that games support learning. First and foremost: people love to play games (Berne 1970). Games allow us to experiment in a safe simulated environment, and the possibility to restart a game at any point allows the practice of trial and error. Games also have a positive effect on the motivation of participants. Furthermore, a cooperative gaming mode gives players the opportunity for guidance in social interaction (De Schutter & Vanden Abeele 2008). Therefore, playing can increase learning in protected settings. To get further into a digital environment, we will use the term "serious games" to refer to "…a mental contest, played with a computer in accordance with specific rules, that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives." (Zyda 2005, 26). Serious games, then, are tailored to achieve new skills and abilities in diverse training settings and learning contexts. So why not use gaming for social inclusion?

In EU Policies, one target group out of three should be addressed by games: "...disengaged and disadvantaged learners, enhancing their employability and integration into society. This includes helping people with *learning disabilities* and young people to be more employable, and to reinsert them into education. This is the area with the greatest activity, focused primarily on *young* people" (Stewart et al., 2013, p. 16). This implies a focus on people facing exclusion from employment, educational barriers and are at risk of low chances to 'employability' (Stewart et al. 2013, 31).

Through games we can guide people to think about, explore, experience, and reflect on complex topics (e.g. multiple crises) and let them act in a safe and reduced way to accomplish new skills. Digital games are also suited to help empower people to connect with others—a major skill for social inclusion:

> *Empowerment comes from making meaningful decisions within a real civic context: we learn the skills of citizenship by becoming political actors and gradually coming to understand the choices we make in political terms. Today's children learn through play the skills they will apply to more serious tasks later. The challenge is how to connect decisions in the context of our everyday lives with the decisions made at local, state, or national levels. The*

> *step from watching television news and acting politically seems greater than the transition from being a political actor in a game world to acting politically in the 'real world' (Jenkins et al. 2006, 10).*

Decision-making seems a lot easier when it is part of a game. By making meaningful decisions in a safe environment, and reflecting on this afterwards, we might transfer game acting into the real world, and empower people to participate in society. The empowerment and inclusion impact of games depends on the game's accessibility to target groups (Bleumers et al. 2012). Therefore, we have to keep technical barriers like unnatural usability, steep learning curves, etc., low, and include target group representatives to participate in the development process. In a nutshell, serious games can help to engage people to participate in society. Through the core principle of social inclusion and the strength of serious games pertaining to learning we can develop deeper learning experiences as well as sustainable knowledge.

3.1. Existing Games and Good Practices

This section explores existing games and good practices. We conducted three interviews with stakeholders, to carve out what kinds of games are presently used, and how they didactically fit and feed into everyday teaching.

- Teacher 1 is employed in an integrative school setting, with composite classrooms with a diverse student population, including refugees and students with disabilities. Classes are randomly put together, with a regulation for gender balance. The students attend different sections, called clusters. The outgoing cluster consists of 32 students, which is comparable to final classes in ordinary schools. These are divided into two different groups, in which every student learns and works individually. The curriculum is the same as in ordinary schools, but students do have to use so-called "personal navigation books" in which the achievement and the effort of the attainable topic is registered. The teachers can choose between ex-cathedra teaching, and individual special needs education. There is also a once weekly coaching session, in which accrued topics can be discussed. Here, students reflect on their social environment or on internal group problems. The school attends a program called "Peer Mediation"[3], where students are trained in mediation. Their task is to mediate between two conflicting parties. The program is voluntary and can be used for conflicts and problems like bullying or discrimination. The teacher said that the inclusive setting is the premise of a social and respectful school environment. The students are prepared for sensitive topics like diversity and social inclusion, no matter if it's disability, migration or any other exclusion criterion. Additionally, game-based learning and gaming in general play a role in the teaching design. According to Teacher 1, involving games in lessons is a general method used to open up knowledge transfer and to increase student interest.

[3] http://www.peermediation.at/index.php?page=0&kat=Peermediation (26.02.2017)

Teacher 1 uses so-called stations and workshops to transmit knowledge. Every student gets a pass where the different achieved stations or workshops have to be noted. A topic of the curriculum is split in different aspects; for every aspect, stations and workshops are created, which the students then have to pass successfully. The students can also act as a team to support each other. For the students, this kind of setting is more interesting than ex-cathedra teaching because they get to move around the classroom or the school building. Another issue for using games is how to check the knowledge acquired. Teacher 1 uses a checking tool called Kahoot.[4] It is designed like a quiz, with a question and four possible answer options. The teacher creates these questions and answer options for each student. The students have to register for this quiz via their mobile phones, during class. After quizzing, the teacher displays the percentage of right answers and time scores with a projector. Teacher 1 highlights the enormous disadvantage that all students need a smartphone and—if there is no WiFi in school—a mobile internet connection. This may lead to exclusion of students with no smartphones, especially at an age where some children already have smartphones and some do not. The school has no WiFi, so e-games are almost impossible to use didactically. Further, the PCs at this school are very old and do not fulfil the criteria for new designed games.[5] Another disadvantage for the didactical use of e-games is that the teacher needs to be highly familiar with them in order to integrate them in the curriculum. Teacher 1's advice to utilize e-games for learning is to do it via hands-on practice.

- The second teacher (Teacher 2) works in a special school, and teaches children to different curricula. Each class holds a maximum number of twelve students, with smaller groups (max five) for subjects like mathematics and German. In the regular classes, students are given individual tasks according to their level. In the smaller groups students are taught in age-diverse groups with intensive support guaranteed. The group teachers discuss the student level every two weeks, so the students can switch between the groups depending on their achieved learning targets. On the one hand, the class system is inclusive, with every student studying individually but together in one classroom. For example, one Syrian girl speaks no German. She is given an individual pre-school program, but attends the class with children of her own age. On the other hand, the performance-related selection in the smaller groups has an exclusive character. However, Teacher 2 argues that the smaller group teaching is very intensive and individual-based. Furthermore, the system is highly transparent, so that students are able to change between groups during term time, according to their performance. The teacher reports that she uses the didactical method of game play primarily to foster student interaction and communication. She also uses game play to impart knowledge and to motivate tired and idle students. She noticed that cultural or

[4] https://getkahoot.com/ (26.02.2017)
[5] See the chapter 'Educator's Toolbox O2' for more detail on technological barriers.

intellectual differences are compensated for in game play, and that everyone is equal in the fun and joy surrounding the games. Games should strengthen group dynamics and social behaviours, as well as the mental well-being of the students. The game Paying Compliments aims at students telling their classmates what is special about him/her. The whole class sits in circle and, one by one, tells another classmate which special ability is characteristic of his/her personality. A second game is called The Blue Line. A blue line is drawn in the middle of the classroom, and it represents a scale from one to ten. Every morning the students have to line up and match themselves with a number. The numbers show their mood, with one being "very bad", and ten "very good". Afterwards they have to explain to the class why they feel like that number. The game fosters reflection on moods and feelings. Teacher 2 has had good experiences with these games, saying that they help students learn to respect each other's feelings. Teacher 2 is critical of games with a competitive character. Her argument is that they always end with at least one student being frustrated because he/she lost the competition, and this is very demotivating. Another reason to use game play is to motivate tired students. Because, in school, students have to learn a lot of things in a very short time, they sometimes need time to rest and clear their minds. For this, Teacher 2 uses board games or active games. In general she is open-minded to digital games, and tablets are available at school. The only disadvantage that she mentioned is that the school has no WiFi, making internet-based impossible to play (which might be a problem e.g. for Iconoscope).

- Teacher 3 works in two different kinds of schools, both in a rural area: one private high school (which has installed the peer-mediation programme mentioned by Teacher 1), and one high school with integrated vocational training (where in association with the interview workshops with students in two different classes were held: one class with diverse students and one class for refugee students only). The subjects teacher 3 is responsible for are religious education, social learning and conflict management (the latter only in the private high school, as students have the opportunity to specialize in social and communication skills); she also trains students to be peer mediators in school. Due to her expertise – teacher 3 has a special training in social learning – and subjects, she extensively and consequently uses games in the classroom, but first and foremost focusses on analogue games as they are applicable for bigger groups: e.g. the "wink-game", "I sit in a train", "ball track" or games which aim to share responsibilities like building a square with a rope with eyes closed or passing chairs from one to another in a circle with only one hand being used. All those games proved to be particularly suitable for reflecting on social issues as they have to be played cooperatively. Another very important game for her is "TABOO", which she described as some sort of analogue version of "Iconoscope": Students have to guess terms one has to describe. Teacher 3 uses this opportunity to dive into the conceptual world of both, those describing and those guessing, when reflecting on the game. Teacher 3

uses digital games rarely. One exception is “Last exit Flucht”, a game provided by the UNHCR, which she played with students mostly during the big refugee movement in 2015. She found that playing this game is a meaningful approach for students to get in touch with refugee issues, although she also recognized that students have the tendency to turn aggressive and frustrated when progress in the game isn’t apparent or technological problems occur. Another digital resource teacher 3 frequently uses is the “digital/ecological footprint”. Regarding the necessary technical equipment, teacher 3 mentioned that in both schools it is quite complicated to easily utilize digital games for daily classroom activities, as they can only be played in PC-rooms which have to be booked in advance (and therefore can’t be used spontaneously). Tablets are not available. Teacher 3 would like to learn more about digital games which fit for classroom activities. She suggested to install an online collection (and description) of digital games suitable for social learning; it additionally should be spread via social media.

3.2. Stop the Mob: Addressing Bullying in Schools

The digital point-and-click game Stop the Mob—designed for computer and tablet use—introduces players to the highly relevant topic of bullying in schools. It presents game players with situations or scenarios in which their actions can make a positive or negative difference for victims of bullying. Aimed primarily at students in lower secondary education, this serious game helps students understand bullying and equips them to identify incidents and actions or inactions as bullying. Most importantly, however, they are made aware that their own actions have the power to prevent bullying and “stop the mob”.[6]

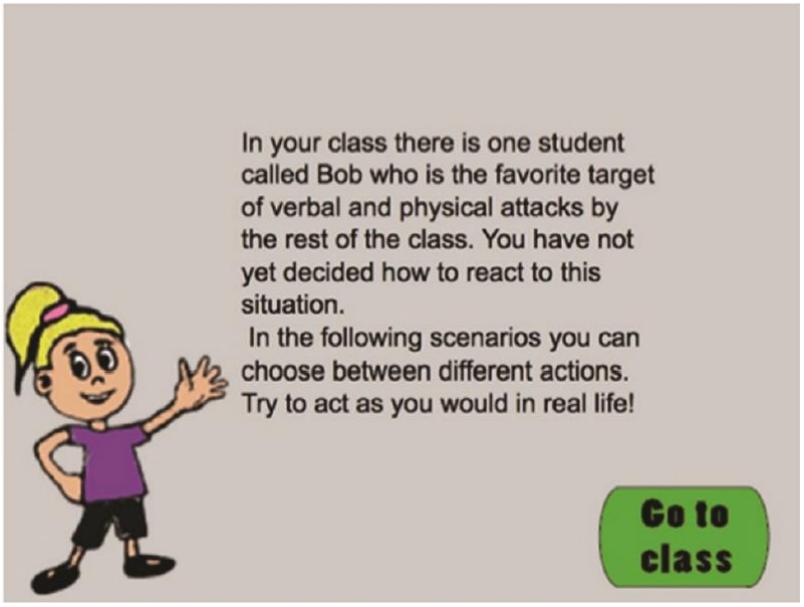

Figure 1: Stop the Mob

[6] Available at http://www.playful-pedagogy.org/stop-the-mob.html

Walsh & Schmoelz (2016) elaborate on how Stop the Mob provides viable possibilities to situate learning, minimize cognitive load, engage the learner constructively and facilitate the learning task of preventing bullying when pedagogically embedded into classroom practice. They argue that educators can integrate the game into their pedagogical practice to fully actualize its potential to prevent bullying.

3.3. eCrisis Game: Village Voices

Village Voices (Yannakakis et al. 2010) is a multiplayer open world game that takes place in an imaginary village. It is designed to be played in a classroom under teacher supervision. On the surface, the game is about survival and prosperity in the village. On closer inspection, however, the game is about friendship and reputation management in the village, and mastery of conflict resolution. When the game begins, each player is assigned a particular character to play (e.g. the alchemist, the blacksmith, or the innkeeper). Players stay as this character for the duration of their involvement in Village Voices. As part of daily life in the village, players will be required to undertake various actions related to maintenance of their characters' livelihoods, and responsibilities within the village. As all the characters are interdependent, situations often arise that lead to conflicts, and the players are responsible for managing them. For example, the alchemist may wish to obtain a plant from the innkeeper to complete a quest involving a health potion, but a longstanding history of conflict between the two may mean that the innkeeper is reluctant to engage in trade with the alchemist. Importantly, the characters will have on-going relationships with both with other player characters, and with non-player characters (NPCs), and the gameplay revolves around management of these relationships.

In keeping with conflict resolution concepts like mutual gain and collaboration (Bodine et al. 1998), the shared objectives of the game are to keep the village healthy and flourishing, in terms of both development and growth, and to minimize negative aspects associated with village life. Each player also has individual survival and prosperity objectives, measured in terms of livelihood, social reputation, health, and wellbeing. But the central objective of Village Voices, related to learning about conflict resolution, is for players to collect achievement badges towards "guru" status. This is attained once a player has experienced and resolved a subset of potential possible conflicts; demonstrated a nuanced understanding of different conflict perspectives; demonstrated the ability to creatively come up with suitable conflict resolution strategies in a range of different contexts within the village, and participated in counselling other players in terms of how to resolve conflicts in a constructive and positive manner.

Game-based learning is fostered when learning is tailored to the needs, beliefs and skills of each player (Egenfeldt-Nielsen 2007). As such, Village Voices adopts high-end game

adaptation technologies for the personalization of game experience. In particular, the game relies on an interwoven player model and adaptation component, yielding personalized conflict scenarios for each player. The player model (PM) component is synthesized from two static and three dynamic modules. The player profile module includes static information such as player demographics and conflict strategy approaches from players' self-reports. The cultural profile contains static information about the cultural background of each player, which impacts on how conflict is dealt with. The three dynamic PM modules include affective/cognitive, behavioural, and group modules. The former incorporates predictors of affective states relevant to conflict, such as frustration and satisfaction, as well as predicted cognitive states, such as attention. These are inferred from the player's facial expressions and head pose. The second concerns identification of typical patterns of playing behaviour. Finally, the group model infers player groups existent in the game based on like or dislike annotations provided by players during the game. The output of the model is the predicted level of conflict for each player in each game quest. The player model is derived from a data-driven, model-free modelling approach in which data from students is crowdsourced in classrooms and conflict intensity is annotated via in-game questionnaires (Berger et al. 2012).

The adaptation component consists of two key modules: one for quest adjustment and one for quest selection. The PM drives quest adjustment as the conflict intensity is tailored to each player. In particular, the game generates events that yield increased conflict within a quest if the predicted conflict (i.e., output of the PM) is too low for a player. Such events include natural disasters—e.g. storms or sudden illnesses requiring specific cures—that force trade between players that are not on good terms with one another. If the conflict is higher than a threshold—determined by teachers—conflict de-escalating events are generated to lower conflict intensity. These may be the emergence of shared enemies in the village, such as rats, or the discovery of an alternative resource. In the quest selection module, the adaptation mechanism picks the next quest to be given to a player once the previous quest is completed. The quest selector picks quests that will likely yield levels of conflict intensity at the limits of the player's comfort level, i.e. quest types that the player has not yet mastered.

3.4. eCrisis Game: Iconoscope[7]

In Iconoscope, the educator picks a set of three from a predefined set of concepts as the input to the learners' tablets. Predefined terms include anything from abstract concepts such as "love" or "freedom" to more specific properties such as "house" or "storm". Each member of the group chooses, in secret, which part of the concept input to use in order to produce a new diagram out of the initial one (or its subcomponents), which expresses (communicates) the concept input, albeit with the above evaluation constraints in mind. Each player (or group of collaborating players) can choose from a predefined palette of shapes and icons existent in the game. They can drag and drop, rotate, resize, and colour existing shapes as well as add

[7] Available at http://iconoscope.institutedigitalgames.com/

new shapes to the shapes suggested by the teacher (see Figure 2). After a period of time has passed, the game is over and the players show their icon to the group, which will then vote. Passing the tablets around, other players (opponents) take turns to observe the icon and choose which of the three initial concepts it represents. Once each player has voted for each other player's icon (and thus each tablet reached the icon's creator), the voting phase is complete. Each player's icon receives a score based on the number of opponents and the votes cast. The scoring system rewards ambiguous icons specific enough to be correctly guessed by at least one opponent. If all opponents guess the concept correctly, or if no opponent guesses the concept then the player loses and receives no points.

Figure 2: Iconoscope

Iconoscope is not just closely related to lateral thinking, but it also 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. These define non-linear lateral paths within the creative (possibility) space as they promote deep exploration of the space of possibilities, which is, in turn, a core characteristic of lateral thinking. Iconoscope realizes diagrammatic lateral thinking since co-creativity in game asset design and icon- or map creation occurs mainly on the visual (diagrammatic) level, in the way images, shapes, and maps are presented in the game. The game expands the very notion of diagrammatic lateral thinking, dichotomizing it into two main creativity dimensions: one that is based on *analogical* thinking—with diagrams and images—and one that works purely on the *visual* level, through imagistic lateral thinking pathways (Scaltsas et al. 2013). Iconoscope thus encapsulates both analogical and visual diagrammatic lateral thinking: the first by constraining the possibility space to high-quality artefacts of value to the given

problem (as defined by the teacher of the context under investigation), which allows learners to draw analogies to context-specific qualities via diagrams; the latter by targeting visual diversity in the suggestions it provides the learner with.

4. Barriers to Social Inclusion through Games

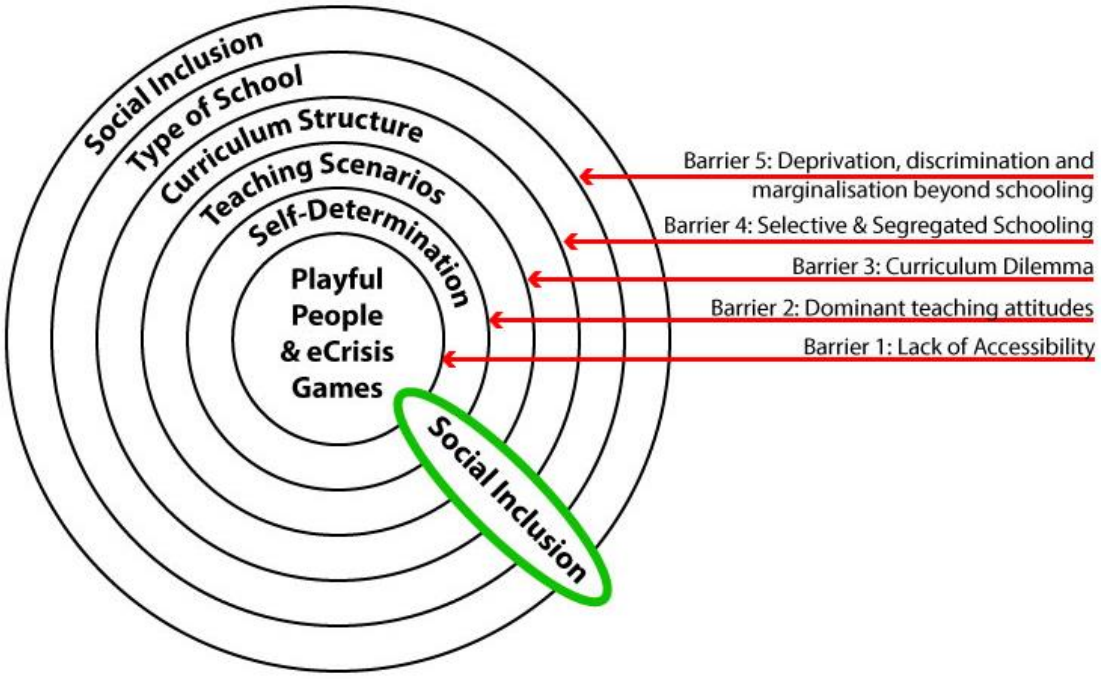

Figure 3: Barriers to inclusion through games

4.1. Barrier 1: Accessibility, Technological Barriers for Social Inclusion

Technological limitations can create barriers to social inclusion. These include accessibility to technology, pertaining to cost of devices or the availability of stable Internet connections at home and in school. Some social groups do not have access to technology such as computers, digital devices, smart phones, and/or Internet access. This social group includes children and youths, and is mainly comprised of the most disadvantaged people in society. Most often people who have no or limited access to technology would already be at risk of social exclusion due to poverty, disabilities, impairments, cultural differences, and migrant backgrounds. While the use of technology at school would be commendable, and even recommended, the fact that these people would be unable to access the programs and applications from home might lead to further social exclusion. When speaking with teachers—especially those working with disadvantaged students or students at risk of social exclusion—they show a reasonably justified concern over this barrier.

However, the technological barrier exists not only for students and young people. Many teachers observe that they themselves doubt their IT skills, and lack the right attitudes for implementing technology-driven practices in their classrooms. Digital devices are therefore

not common in classrooms. Unfortunately, a lack of funds result in many schools lacking in devices required for digital learning. In some cases, the devices have been acquired but aren't used due to a lack of ideas, knowledge, proper learning materials, easy usability, and readily available technical support. Despite this, teachers do take initiatives and even experiment to try and implement novel digital practices in class. A further step and potential barrier, is the skill in finding and implementing technologies for students with diverse and special learning needs. Most often this is a matter of trial and error, leading teachers to reflect on whether their experimentation in class would indeed lead to increased learning benefits, and weighing this against the perceived risks. The result is that most often teachers decide to abandon their initiatives in favour of familiar practices they would be more confident to use.

4.2. Barrier 2: Dominant Teaching Attitudes

A second barrier to social inclusion can be found in the culture surrounding the belief-structure involved in learning. Teachers, 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. As teachers themselves observe, this places a substantial amount of pressure on them, since the performance of the students—especially during exams—is judged to be directly related to the amount of content that they as teachers have manage to transfer to their learners. 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 relating to impairments, disabilities, as well as migrant culture backgrounds, tend to be set aside in favour of other priorities, such as assessment and learner performance, and covering the subject syllabi. This in itself reinforces social exclusion and sets a barrier to supporting social inclusion and creativity in the classroom. Additionally, teachers tend to favour the teaching methods that they themselves were taught. This does not include the use of technology-driven devices, applications, and software. Teachers' perceived limited skill set results in low confidence in their own capabilities to handle technology in class.

4.3. Barrier 3: Curriculum Dilemma

The current teaching curriculum does not allow teachers the flexibility to shift content so as to address different skills. Teachers teaching a specific subject area are quite often restricted by rigid syllabi geared towards the successful completion of the end of year exams. Different schools and different subjects all share the same syllabi, regardless of the backgrounds and needs of the student population. There are some exceptions in some core subjects, where students can be streamed according to their chosen exam level. Attempts have been made—such as the local Maltese system—to migrate to a learning outcomes framework system. However, the current structure for assessment, which is heavily dependent on summative methods and exams, is still prevalent across schools and educational institutions, and this

creates distinctive barriers to adopting innovative teaching practices. Such prescriptive subject syllabi leave little space and limited time to teachers to experiment with new techniques and teaching methods, including the use of games. Moreover, each subject syllabus is designed to cater to generalized learner characteristics, and the content that has to be transferred to the learners does not itself cater to difference, and can thus be said to increase social exclusion in the classroom.

4.4. Barrier 4: Selective and Segregated Schooling

The barrier represented by the deep-seated selectivity of many educational settings shows the dependency on regulations in questions of social exclusion and inclusion. Labels related to disability, societal backgrounds, and academic proficiency lead to specific curricular associations and school types. Despite active efforts to promote inclusive facilities and services, specialized provision is still more often than not the established routine. Children and youths with disabilities, and those with migration or refugee backgrounds, often face limited accessibility to mainstream settings for a number of reasons, such as limited availability of assistive services, infrastructural inaccessibility, lack of awareness, etc. Few schools have good experiences with diverse student populations in terms of academic achievement and thus avoid such populations. Specialized facilities often offer better student-teacher ratios and more highly trained teachers. Resource allocation thus does play a role.
However, it is important to note that it is not just external aspects that hinder these groups from active participation in educational settings. There is also the fear of parents that their children would be left behind or subject to scolding in a mainstream setting. Attitudes do play a huge role in relation to educational decision-making and opportunities.

4.5. Barrier 5: Deprivation, Discrimination, and Marginalization Beyond Schooling

Exclusion from educational facilities does imply restricted access to other areas of life, as it leads to stigmatization, and often opens up to specific pathways in further education and vocation. This leads to further exclusion and unavailability of certain opportunities in areas of life beyond school and education, amongst them opportunities on the job market. Low levels of education lead to restricted job options, as implied in the opening sections of this paper. The job market focuses on able-bodied and well-educated people, leaving others out. A lack of, or low, income leads to economic deprivation, which implies poverty and further exclusion from other areas of life.

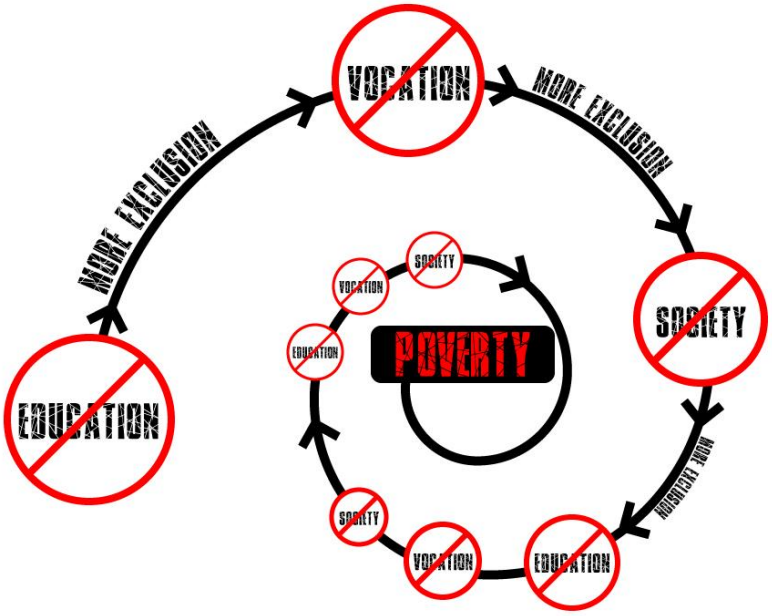

Figure 4: Exclusion - Poverty Spiral

Unfortunately, many of the key stakeholders—including teachers, parents, and even students themselves—still view games are just for fun, and provides a mental break from content transfer, offering little in terms of learning.

These issues and challenges make it difficult for teachers to justify the use of games such as Village Voices or Iconoscope in their subject areas. After all, social inclusion and creativity are not perceived as part of their subject matter and is not specifically addressed in the syllabus. The Maltese curriculum does address such issues, but they are there seen to belong to the subject of personal, social, and career development (PSCD). In this way, teachers any other subject most often ignore issues pertaining to inclusion or exclusion, leaving these to be tackled by the PSCD specialized teachers, simply because they would not have the time to deviate from the syllabus content that he or she is expected to cover with the students throughout the academic year.

5. eCrisis Stakeholders and Challenges

The last decade of European history has been characterized by serious societal challenges and conflicts that have occurred as emergent by-products of economic recession, social structure instabilities, and, most recently, the discrimination of and barriers against refugees.

5.1. Reflective Workshops and Interviews

The participating countries all organized a series of reflective workshops and interviews. These events served a threefold purpose for the eCrisis project. First, they identified problems and challenges strongly relevant to the target groups, and did this at the initial stages of the project. Second, they served to identify the main core of schools and practitioners who are key stakeholders of the project. These key stakeholders are the core drivers for further development, analysis, validation, and refinement of the remaining intellectual outputs.

The reflective workshops and interviews aim to identify

- key stakeholders such as teachers, students, people with learning difficulties, people that seek refuge
- key challenges that are shared throughout participating stakeholders as well as specific to certain stakeholders

No.	Date	Stakeholders/ Institutions	Challenges	Venue, Country	
1	1.9.2016	Teachers, people with learning difficulties, refugees, assistants	Belittlement, Empowerment	Department of Education, Vienna, Austria	19
2	21.10.2016	Federal Ministry of Education, Regional school authority (Tirol). Teachers from various schools	Belittlement, Missing Focus	eEducation Conference, Linz, Austria	25
3	14.11.2016	Teachers at St. Ignatius college, teachers and head teachers present from primary, middle and secondary schools	Bullying, challenging student behaviour towards other students as well as teachers	St. Ignatius Middle School, Handaq, Malta	12
4	15.11.2016	Group interview with primary school teachers	Bullying, racist/discriminatory stances towards other students, lack of empathy linked to conflict in school	Ellinogermaniki Agogi Primary School, Pallini,	3

				Athens, Greece	
5	18.11.2016	Group interview with secondary school teachers	Racist/discriminatory stances in society, tensions between majority and minority religious communities	Ellinogermaniki Agogi Secondary School, Pallini, Athens, Greece	2
6	19.11.2016	Interview with the head teacher	Implementation of very basic measures, especially Greek language learning, for the inclusion of immigrant children from very diverse cultural and ideological backgrounds; very high drop-out rate, with many students quitting during the school year	Secondary school at Lavio, Attiki, Greece, with a multicultural immigrant student population and relevant inclusion activity	1
7	24.11.2016	Workshop with social sciences university staff and 1st year pre-graduate students studying Games and Communication	Repurposing existing games for societal purposes, such as to address rapid social changes in Europe, financial and economic crises in Europe, lack of strong and visionary political leadership, globalization and global crisis, terrorism, refugee crisis, current political controversies (e.g. building fences/walls at border lines), violence at home, violence or discriminatory behaviours during school break, etc	Panteion University, Athens, Greece	3 university teachers, 44 1st year pre-graduate students (~18 year olds)
8	1.12.2016	Class for refugee students at HBLA Oberwart (Burgenland, Austria)	Language (1 student spoke and understood Arabic only; all the other students spoke and understood Farsi and Dari; all of them just started learning German) Belittlement (Games were too childlike for the students) Accessibility of digital games, which were in German, Greek and English only Digital games turned out to be too much individual-centred (the students impressively	HBLA Oberwart (Burgenland, Austria, a high school with vocational training)	1 Teacher, 19 students

			showed a preference for group games)		
9	02.12.2016	Workshop with primary school teachers from various schools in and around Athens, working on pro-sociality in schools through games	Linking eCrisis efforts with efforts promoting pro-sociality in schools through the use of games	Ellinogermaniki Agogi Primary School, Pallini, Athens, Greece	5
10	05.12.2016	Workshop with primary and secondary school teachers	Detrimental effect of financial crisis in urban areas, North-South tensions in Europe, immigrant refugee crisis, racism/bullying at school, teachers' reluctance to see digital games as tools for social inclusion	15th Gymnasium, Peristeri, Athens, Greece	34
11	07.12.2016	High school Class 2 at HBLA Oberwart (Burgenland, Austria)	-formation of groups -illegitimate use of tablets (taking selfies/photos, playing different games, one called Akinator http://de.akinator.com/ → a person is imagined by one and questions are given by Akinator App till the App guesses the imagined person. A lot of political tension, because Adolf Hitler was imagined and also local politicians) -analogue games are preferred, motivating factors were communication and socialization)	HBLA Oberwart (Burgenland, Austria), a high school with integrated vocational training	16
12	07.12.2016	Interview with advisors at the Institute of Educational Policy	Links of the eCrisis efforts to specific school curriculum areas and other on-going initiatives	Institute of Educational Policy, Ministry of Education, Athens, Greece	2
13	9.12.2016	MIT (Mobile Intercultural Team) from the Vienna School Board	Student topics: Family Structures	Department of Education, Vienna, Austria	1

14	12.12.2016	Workshop with university staff and students	Repurposing existing games for societal purposes, such as to address racism and lack of tolerance in school, financial crisis, refugee crisis, links of such efforts to specific areas of the curriculum.	University of Athens, Athens, Greece	1 university teacher, 14 students
15	13.01.2017	Class of children from ZIS and teacher	-language (different mother tongue, one Syrian girl has studied German for only two months) -game-based learning (Syrian girl has learnt numbers playing with a dice) -high levels of support and assistance for students who did not understand games or the rules -high level of community, though participants were from different classes -great interest in Iconoscope	ZIS School (school for students with special needs, small classes with max. 10 students and two attending teachers)	11
16	17.02.2017	Village Voices Event	-bored after 15 minutes playing Iconoscope. -set up testing the day before -switching between Village Voices and Iconoscope was hard	Department of Education, Vienna, Austria, Integrative Lernwerkstatt Brigittenau	22
17	21.02.2017	Problem-centred interview with a teacher	Technical barriers and inflexibility in school rooms, language, bullying and social exclusion amongst students, social issues only to be addressed in “special” subjects such as religion (which only declared students attend) and social learning (which is only provided in high schools with a special focus on social issues)	HBLA Oberwart, Austria (high school with vocational training)	1 teacher
18	23.02.2017	Problem-centred interview with a teacher	Technical barriers and inflexibility in school rooms, language, bullying and social exclusion amongst students, diversity of students, migration background	Department of Education, Vienna, Austria	1 teacher

19	24.02.2017	Problem-centred interview with a teacher	Technical barriers and inflexibility in school rooms, language, diversity of students, migration background	Integrative Lernwerkstatt Brigittenau, Vienna (school in which all students are taught between the years)	1 teacher
20	22.03.2017	Online study unit (LAS2035 - Games for Learning) reflective discussions	Bullying, social exclusion of minority groups, managing learning difficulties and challenging student behaviour	University of Malta	7 teachers
21	08.05.2017	Briefing talk at the annual PD meeting for Guidance and PSCD teachers. Project ideas and concepts will be highlighted.	Discussions of challenges in schools and classrooms and how these can be overcome	Ministry of Education, Malta	50 educators
22	May/June (forthcoming)	Teacher initiative – lunch break game club	Student motivation and engagement, social exclusion, bullying	St Margaret College, Malta	3-4 educators & 15-20 students
Total number of reflective workshops and interviews: 22			Total number of participants: 238		

5.2. Key Stakeholders

Greece

- Ellinogermaniki Agogi Primary School (Pallini, Athens, Greece).
  A primary school with approximately 1,000 students from various urban and suburban areas in greater Athens.
  Link: http://www.ea.gr
  Head of School: Agapi Vavouraki
  Number of key stakeholders: 3

- Ellinogermaniki Agogi Secondary School (Pallini, Athens, Greece).
  A secondary and upper secondary school with approximately 600 students from various urban and suburban areas in greater Athens.
  Link: http://www.ea.gr

Heads of School: Litsa Petrea, Manos Apostolakis
Number of key stakeholders: 2

Malta

- Qormi (SS) Primary School
  This primary school is for students aged between 5-10 years. It aims to foster integration and inclusion by giving support to students of varying abilities and disabilities.
  Head of School: Ms. Josephine Baldacchino
  Key stakeholders: 4

- Handaq Middle School Tal-Handaq
  This middle school is a co-ed school for students between ages 11-12 years with a mission to prepare students for a more holistic approach to education and learning.
  Link: http://sic.handaqgirls.skola.edu.mt/messagg_kap_skola.html
  Head of School: Ms. Maria Montebello
  Key stakeholders: 2

- Handaq Secondary School Tal-Handaq
  This secondary school is for students of aged between 13-15 years with a mission to prepare them for entry-level exams into post-secondary school education, as well as to give a more holistic approach to education through the various activities organized by the school staff.
  Link: http://ksihandaq.wixsite.com/handaq
  Head of School: Ms. Alexandra Farrugia
  Key stakeholders: 4

- St Margaret College, Secondary, Verdala
  This secondary school is for students aged between 13-15 years with a mission to prepare them for entry-level exams into post-secondary school education as well as giving a more holistic approach to education through the various activities organized by the school staff.
  Link: http://smcsecondary.com
  Head of School: Mr Joe Ellul
  Number of key stakeholders: 2

- Guidance teachers Malta
  A group of teachers involved in career- as well as personal- and social guidance. A number of guidance teachers are present in all schools in Malta.
  Link: http://careerguidancemalta.blogspot.com.mt
  Contact person: Ms Dorianne Gravina

Number of key stakeholders: 50

Austria

- HBLA Oberwart (Burgenland, Austria).
  A higher vocational school offering education and training to 740 students. The students can choose between four branches: Fashion and Clothing, Product Management, Tourism, and Service Industries.
  Link: http://www.hbla-oberwart.at/en/home/
  Head of School: Aristoteles PAPAJANOPULOS
  Number of key stakeholders: 2

- ZIS 18 School (Vienna, Austria).
  Center for students with special needs, small classes with max. 10 students and two attending teachers)
  Link: http://integrativeschulehernals.schule.wien.at/
  Head of School: Martina HOCHENAUER
  Number of key stakeholders: 1

- Integrative Lernwerkstatt Brigittenau (Wien, Austria).
  A comprehensive school for students between 10 and 15 years with and without disabilities.
  Link: http://www.lernwerkstatt.or.at/
  Head of School: Josef REICHMAYR
  Number of key stakeholders: 1

- Tagesstätte Lanzendorf (Lower Austria, Austria).
  The “Tagesstätte” is a housing facility with pedagogical specialization for people with disabilities and learning difficulties.
  Link: https://www.caritas-wien.at/hilfe-angebote/menschen-mit-behinderung/tagesstaetten/industrieviertel/tagesstaette-lanzendorf/
  Number of key stakeholders: 1

5.3. Shared and Regional Challenges

The reflective workshops and interviews with the key stakeholders and additional participants revealed crucial shared and regional challenges.
Some reflective workshops and interviews were held as post-gameplay activities and have also been used to inform the prototypical eCrisis Scenario (see section “Teacher Guidebook”).

Key societal challenges that have been identified in the workshops and interviews:

- Bullying
- High drop-out quote, with many minority-group students quitting during the school year
- Interest in diverse family structures
- Language

- Racism
- Lack of empathy. Unattended emotions and challenging behaviours in students and teachers.
- Unheard voices
- Lack of support for victims

Challenges that are specific to using games for social inclusion:

- Belittlement
- Reproducing discursive practices
- Language
- Accessibility
- Necessity of high levels of support and assistance due to the lack of usability and non-self-explanatory games

6. Toolbox (O2)

The Educator Toolbox includes games adopted by the social inclusion framework currently existing in primary and secondary school education. The games are designed to train soft social skills, such as conflict resolution, and to foster creative thinking and reflective debate within societal themes. Core to the Toolbox are the eCrisis games Villages Voices—for enabling conflict resolution—and Iconoscope, which promotes creative thinking and diagrammatic creativity.

The Toolbox contain games and tools

- that fit the requirements of the key stakeholders
- that allow teachers to integrate, via the implementation of authoring tools, eCrisis pedagogical scenarios within the computational tools and games
- that allow teachers to continuously author new content and game scenarios for their educational purposes

For these purposes the toolbox (O2) is re-designed and implemented under the entirely **new framework** delivered here.

6.1. Technological Barriers for Students

When testing Iconoscope and Village Voices in the field we discovered some technological barriers that could harm learning processes. It is worth mentioning that learning on a tablet, e.g., through Iconoscope, entails a lower frustration level than in learning on PCs or classical (non-digital) settings. If the game initially failed to work, participants would change the device once, but sometimes not even that. Improvement of technological stability and usability has therefore been a focal point in further research steps to increase learning processes. The major development concerning the games provided should be easy handling for the target group; game developments need extensive testing. One of our early results show that playing on tablets seems to aid socialization.

With regards to people/students with learning disabilities, specific handling concerns need to be recognized. First of all, simple and recognizable language is a must (Flieger 2015; Hauser 2016), both for students with learning disabilities and for students who have not yet learnt the language. Special terminology needs to be replaced with established, well-known, and common words for buttons, tasks and items. Long pieces of text are to be avoided; video tutorials might be a better way to fit the needs of users.

Additionally, graphical improvements to aid people with visual disabilities need to be considered.

6.2. Technological Barriers for Teachers

The starting-up stage of a game in school has to be quick and smooth. Teachers only a have a few minutes to start a piece of software in class. Automation of processes has to be focused. The process of starting a game should be minimized to a few well-known steps, that require little technological skill, and that don't consume much time. Errors have to be reduced and if they occur, a user-friendly documentation and troubleshooting guide must be easily available to fix bugs.

Bad practice, e.g. checking an IP address, and starting up two command windows is too much, especially if you have to do this for one session with four players. One class consists of at least twenty students. For teachers without technological experience, a click or task too much for starting up, can result in the decision to terminate the practice for good. Keeping the setup as simple as possible is a main goal when developing serious games for teaching purposes.

6.3. Village Voices

Village Voices turned out to need a specific setup, requiring stable Internet and network-connections as well as fast hardware. Preparation needed some time, which is why Village Voices could not be easily played in classroom settings (which acquire short preparation times, as settings can only be prepared in breaks between teaching units). With regards to O5, an improvement in this aspect would be necessary. Other results of the workshops and reflective debates—also concerning O5—were:

- Students did not read introductions and textboxes
- Social interactions were rated randomly—students did not take care in expressing their feelings during the game session; they wanted to move on with the game and seemed annoyed by being regularly asked to express how they felt
- Communication of opinions mainly took place between students, not in-game
- The game lacks a clearly defined aim, which is why trading is quite easy: without selfish/aim-oriented ambitions, players are more likely to give what they have
- For adults, the game is boring after approximately fifteen minutes

Category	Description	Priority
Starting up the game	At the moment two applications tipped in four IP addresses are needed to start the game. An easier way to connect devices is needed, where the host starts a server and the masterserver.exe automatically. Other user should see this server automatically and click on "join game". By a first	1

	come, first serve principle nobody else should be able to connect after 4 are connected. Users should not have to type in their IP addresses.	
Tablet Build	As many schools in Malta and Austria are better equipped with tablets and Unity allows for exporting for different platforms, and Android/IOs build would good.	1
Role of mayor	An additional computer-driven role for “the mayor” should be established. This figure can give new quests to the players, and give rewards for accomplishing quests, as well as possibly rating the success of the players.	2
Gender	At the beginning of the game the player should be randomly assigned a gender. It would be good if two male and two female players start the game.	1
Visibility of achievement	The game requires the characters to build things like the biggest bread, a scarecrow, etc. These items should appear on screen when built so that if a player successfully creates a straw man, the straw man would become graphically visible in the field. The player would thus get something for their resources, and the resources don’t just disappear.	1
Accomplishment of tasks	A visual sign should be given at the accomplishment of a task, for instance, showing that all necessary materials have been secured.	2
Auto shrink	If the gaming window shrinks, the game should shrink in proportion, Some icons at the bottom can’t be seen if the monitor has a smaller resolution than the recommended 1024x768.	1
Team quest	While every player has a task, and the game is played together, there exists no task in which the players actually have to work together to accomplish a quest. A possible joint task could be the building of a house, with everybody making a contribution to the process. A dramatic or epic event could take place, e.g., the city is flattened and the problem can only be solved if everyone works together.	1
Destruction	Buildings can be destroyed, but this does not really affect the game. This should change. Ex: if a building is destroyed, two resources can be stolen by the other villagers. So the villager has to “protect” their goods.	2
Level system	Points should be awarded for winning resources, crafting things, and accomplishing achievements, and the player levels up after gaining a set amount of points. Points are reduced from bad behaviour. A best-player list should be established.	3

Achievements & badges	Achievement should be mapped into badges. The badges should be shown in a separate tab. It might also be possible to have an achievement tree.	2
More quests	Students suggested the characters could fulfil other tasks than those already set up.	2
More activity	Students and migrants suggested more proactive opportunities: they want to build things, and they want to have more resources to build something together. To only collect things and work on the quests turned out to be a bit boring after a while.	1
in game description	General information on e.g. that clicking the blue windows starts villages voices, how to control players, how to repair houses, how to give feedback to other players (write comments on the wall) need to be visible in the game, at the time the player needs this information.	1
Feeling	A button/icon showing the average of all players' feelings would be nice.	1
system requirement	The system and network requirement for using the game should be listed in a document.	1

6.4. Iconoscope

Iconoscope was provided on tablets during each data-collection workshop. Participants received the information of the main content, as well as operating instructions. This lead to many participants trying out the game, but they switched to another (analogue or online) game after a few minutes. Reasons provided were:

- technical bugs, which stopped the game or lead to errors in the graphic representation
- concepts to be displayed were too complex (particularly for participants who just started to learn German)—additionally offering easier terms might help to increase participation (and consequently social inclusion) of all persons in a social group such as a school class
- operation languages only in German, Greek and English. Translations into other languages would be needed to increase the flexibility and applicability of the game
- the applicability and use of Iconoscope for teaching and classroom-purposes as well as for students themselves is not self-explanatory. Specific settings and recommendations on how to use Iconoscope and for what purposes need to be provided

Category	Description	Priority
Authoring Tool	Students and Teacher should be able to add/customize words, concepts and triplets that they would like to use	1
Rubbish bin	Several players asked how to delete items. Therefore, a rubbish bin should be displayed on screen. (Suggestion for app and browser)	2
Colour-blind mode	Considering colour-blind people, or people with other vision disorders a mode for colour-blind people should be established. Instead of filling out the triangle with the colour green, it could be filled with dots, etc. (Suggestion for app and browser)	1
Error message WiFi	At the moment the internet connection is not working, and there is no error message. This causes the problem that the assistants don't give any suggestions and the users don't know why. An error message should appear if the app can't connect to the internet. (Suggestion for app)	2
In-Game Path	After finishing one's symbol, the next step is guessing other people's symbols, the user has to leave the app and is forwarded to the website display. This causes some confusion. Therefore, the guessing part should be displayed in the app and the user should not leave the app. (Suggestion for app)	1
Description	Research showed that playing Iconoscope is not that easy. More description on how the game works should be added so as to prepare players for the requirements of the game and alleviate frustration. A short tutorial could be added, since reading poses a problem to people with learning disabilities. (Suggestion for app and browser)	2
E-mail checking	It makes sense to check e-mail addresses if it is necessary to type it in. If not, a username could fulfil the same function. Many pupils don't use e-mail addresses. (Suggestion for app and browser)	2
Username	At the start of the process, the user has to type in a username and an e-mail address. This seems unnecessary and slows down the starting process. The username should be typed in after the drawing is completed. (Suggestion for app and browser)	1
Text field modification	The keyboard doesn't display the text when typing in the username and e-mail address. This should be fixed. (Suggestion for app)	1
Drawing	One suggestion was to add the possibility for drawing own structures. This could enhance creativity. (Suggestion for app and browser)	3

Iconoscope voting connection	After finishing the drawing the user sees the pictures drawn by others. Unfortunately, sometimes the connection is not working in the app and is slow in browser. This delay should be reduced by half.	2
Iconoscope voting	After finishing the drawing the user can guess what the other users have drawn. When a guess is submitted by clicking the button, the button turns blue, but it does not display the concept. The user should get to know which concept is intended, e.g., by this concept button turning green.	2
Iconoscope font	When choosing the word for drawing we discovered that the word can't be easily read, since the font is too small. The font size should be increased to 12-14pt.	1

All above recommendations and issues identified by teachers will be examined for their technical feasibility and will be reprioritized based on the technical and budgetary constraints of the project. This will be part of work under the IO2 intellectual output of eCrisis.

7. Teacher Guidebook (O3)

The Teacher Guidebook includes a customized program and an innovative set of courses in social sciences to specifically address social challenges such as conflict, social exclusion, and social, cultural, and economical diversity.

The Guidebook will contain materials for class preparation, course development, and sample course modules utilizing the eCrisis Toolbox for game-based learning activities.

For these purposes this section presents **teaching attitudes, pedagogical scenarios, and different forms of reflective debate** based on above-mentioned objectives, challenges, and game technologies to inform the Teacher Guidebook (O3).

Gaps that can be addressed in the scenarios are:

- Highlighting differences of ideas and how these differences may be used to reach the same conclusions
- Highlighting how different cultures may have different thoughts/ideas on how to resolve conflicts, and how to find the middle path to negotiation
- Highlighting how language may be a huge barrier to the resolution of conflicts, and how communication is key
- Using different languages effectively to handle different situations and deal with specific contexts

- Highlighting aspects of bullying and how language, impairments, and disabilities may be a barrier to the successful resolution of conflicts
- Using creative iconography to express and convey meaning to different words or terms

To attend these gaps a key set of teaching attitudes, pedagogical scenarios, and different forms of reflective debate are described.

7.1. Set of Teaching Attitudes

Teaching attitudes and learning settings can either aid or block reflective thinking. There are general principles for teaching and learning that apply to reflective thinking.

Dewey (1933) has described core teaching attitudes:

- *Whole-heartedness* is the teacher's enthusiastic and curious attitude towards her/his subject area.
- *Directness* is the teacher's undistracted attitude towards the learner, uninterrupted by self-absorption, anxiety, content, performance indicators, as well as worry about the judgment from others. "A reflective teacher who possesses an attitude of directness might well ask, 'Where was the learning in today's work?' This is a very different question to 'What did I teach today?' " (Rodgers 2002, 860)
- *Open-mindedness* "is not a blind acceptance of all ideas without intelligent critique. Rather, it means a willingness to entertain different perspectives" (Rodgers 2002, 861), and an acceptance of the "possibility of error even in the beliefs that are dearest to us" (Dewey 1933, 30). Being "open-minded means not only being hospitable but also being playful—not clinging too tightly to our ideas but releasing the mind to play over and around them" (Rodgers 2002, 861).
- *Responsibility* means to think about the possible consequences of actions. Being a responsible teachers means that only a "carefully considered line of thought should lead to action" (Rodgers 2002, 862).
- *Readiness* is a kind of prerequisite for the other attitudes. It means being ready and willing to be direct, open-minded and responsible in our everyday teaching practice. It also indicates that being direct, open-minded, and responsible is not an easy task. Accepting that these attitudes are helpful for learning and reflective thinking is an important first step.

Rogers (1983, 121-126) has described further core teaching attitudes:

- *Realness* means that the feelings that we experience are available to us and our students. It is both about a steady awareness of our experiences and the feelings that are involved in these experiences, as well as that we make these feelings transparent to our students.
- *Acceptance* and *openness* is the teacher's quality to see, experience, and acknowledge a student as a full and capable "person, having worth in her own right" (Rogers 1983,

124). This kind of acceptance includes both “positive” and “negative” thoughts, feelings, and actions of students.

- *Empathic understanding* is the willingness and “attitude of standing in the other’s shoes, of viewing the world through the student’s eyes”: the “ability to understand the student's reactions from the inside”, and the “sensitive awareness of the way the process of education and learning seems *to the student*” (Rogers 1983, 125).

7.2. eCrisis Post-game Activity: Reflective Debate

Reflective debate is a pedagogical approach that aims to enable reflective thinking as a key competence for social inclusion (see section on “reflective thinking”, above). There are different pedagogical approaches to enable reflective debate:

7.2.1. Narrative-Socratic Dialogue

Narrative-Socratic dialogues follow a threefold structure:

- generative phase
- immanent phase
- exmanent phase

First, (a) generative question(s) is asked so that a main narrative can unfold. After this question(s) the informant should have time to speak without interruption. The researcher only speaks to motivate and prolong the narration of the informant. Occasionally, the researcher can take notes of crucial aspects to follow up on in the immanent phase. The narrative part of the dialogue might show how students or teachers concatenate occurrences and therefore evoke lived experiences (Schuetze, 1982, p. 579).

Second, the immanent phase (Riemann, 2003, pp. 12–13) aims to reiterate crucial aspects already mentioned in the generative phase. The researcher can ask questions based on the notes from the generative phase. The immanent questions keep the informant focused on revealing how their thinking about an experience evolves and on reconstructing their own story about certain personal experiences. The Socratic part of the dialogue can unfold at the end of the immanent phase, by asking Socratic questions for clarification, and probing the assumptions, implications, and evidences (Paul & Elder, 2006) that have been provided by the informant in the generative phase.

The exmanent questions (Riemann, 2003, pp. 12–13) are structured questions that allow the researcher to introduce new topics. This is the only phase in which the researcher can bring in aspect the have not been mentioned by the informant. In the exmanent phase, the Socratic questions involve reflection on and negotiation of the importance and value of their story. This points to the last part of the exmanent phase, in which argumentational statements can

be elicited that might include evaluations and reviews of what has been said before (Riemann, 2003).

7.2.2. Picture-based Dialogue

A second possibility for employing a reflective setting in class is arranging a picture-based debate. The teacher chooses different pictures "representing different areas of political crisis." (Kremsner, Proyer & Schmölz 2016, 2) The pictures may be of a woman wearing a burka; a refugee camp, or a Syrian war scene. Every student chooses his/her favourite picture and explains what they think about it. This practice should bring awareness of the specific intention of the task, and involve the group in critical reflection and discussion. Kremsner et al.'s (2016, 3) example is a picture of a child with Down´s Syndrome. The setting was a fundraising campaign and advertisement in which the child was shown as a happy and laughing person joyfully playing with finger paint. Obviously, the campaign aims to show that this child is disabled and needs support, which one can contribute to by moneyed assistance. In this case, advertisers use a discursive practice to cope with people´s insecurity surrounding unfamiliar topics and situations. On the other hand it aims to also convey the child as "extraordinarily cute, friendly, warm-hearted, easy-going etc." (Kremsner, Proyer & Schmölz 2016, 3 & 11) This is a typical example of belittlement of people with disabilities to cater to people´s ignorance and make them part of their economic business, through fundraising. In general, picture-based debate fosters critical thinking and debate about societal issues as well as open-mindedness about different perspectives pertaining to a specific topic.

7.3. Teaching Scenario 1: Open Gameplay and Picture-based Debate

Setting

- A minimum of two lessons (1h 30 min), but ideally open-ended.
- Some tables are put together in the room.
- The games are placed on these tables.
- The rest of the tables are moved to the walls, so that there is a lot of space to move around.
- Chairs can be adjusted by the students to facilitate game playing.

Agenda

(1) Introduction (5 min):

- Aim: Participants get an overview of the room, the unregulated and open setting, and the timeframe.
- Description: Teacher introduces the setting and lets participants know that they can freely explore and play the game for approximately 1 hour. The teacher explains that they can choose which games to play, with whom they want to play, and for how long they play any single game before switching game and co-player.

(2) Gameplay session (55 min):

- Aim: Participants can enjoy playing games together and can encounter each other without any teacher input and evaluative performance pressures.
- Description: Participants take part in a non-regulated session, are offered to play board- or card games (chess, Mikado, Uno, Memory, Ludo) or digital games (Village Voices, Iconoscope, Stop the Mob) provided on tablets or laptops. All games are set up on a table that is accessible to everybody, so that participants can freely choose what, when, and with who they want to play.

(3) Reflective debate (30 min):

- Aim: Participants can talk about their experiences in the gameplay session and voice what they have learnt and felt by connecting their experiences to certain pictures. Pictures aim to direct reflection towards certain societal challenges.
- Description: A picture-based reflective debate (see section above) takes place. To incorporate societal challenges such as pity and belittlement as well as assumptions towards socially marginalized people the discussion is based on a sample of pictures and photos pre-selected by the facilitator. These intentionally used pictures can be taken from a simple online image search for e.g. “disability”, “intellectual disability”, “pity”, “refugees”, “prejudice”, or “inclusion”. Participants are asked to choose one or two of these images based on their gameplay experiences and express their thoughts and feelings about them.

7.4. Teaching Scenario 2: Focused Gameplay and Narrative-Socratic Debate

Setting

- A minimum of two lessons (1 h 30 min), but ideally open-ended.
- Some tables are placed together in the room.
- The games are placed on these tables.
- The rest of the tables are moved to the walls, so that there is a lot of space to move around.
- Chairs can be adjusted by the students to facilitate game playing.

Agenda

(1) Introduction (5 min):

- Aim: Participants get an overview about the room, the setting, and the timeframe and focus on societal issues.
- Description: Teacher introduces the setting and lets participants know that they can freely explore and play the game for approximately. 1 hour. The teacher explains that they can choose which games to play, with whom they want to play, and for how long **and** mentions societal and communal issues such as political friction, bullying, discrimination, and exclusion to get the students focused on these issues.

(2) Gameplay session (55 min)

- Aim: Participants can enjoy playing games together and can encounter each other without any teacher input and evaluative performance pressures and may already talk about societal and communal issues.
- Description: Participants take part in a non-regulated session, are offered to play board- or card games (chess, Mikado, Uno, Memory, Ludo) or digital games (Village Voices, Iconoscope, Stop the Mob) provided on tablets or laptops. All games are set up on a table accessible to everybody, so that participants can freely choose what, when, and with who they want to play.

(3) Reflective debate (30 min):

- Aim: Participants can talk about their experiences in the gameplay session and connect their experiences to societal and communal issues.
- Description: A narrative-Socratic dialogue debate (see section above) takes place.
    - Generative phase: deals with the gameplay. Questions should motivate students to freely talk about the gameplay session. What happened during the gameplay: describe from the beginning until the end. What did you experience? How did you play the games? Who was playing with who? When did new interaction or a change of playing partners or games occur?
    - Immanent phase: The teacher reiterates aspects from the generative phase that has already dealt with societal issues (if any): what kind of social issues appeared and why? How was this connected to the gameplay? Why do the participants drop the discussion about the social issue? If the teacher notices a high-tension issue, it is worth asking further questions about it in plenum.
    - Exmanent phase: The teacher can bring in additional societal challenges that are interesting to him/her.

7.5. Teaching Scenario 3: Village Voices and Narrative-Socratic Debate

Setting

- A minimum of two lessons (1h 30 min), but ideally open-ended.
- Some tables are placed together in the room.
- The laptops are connected and placed on these tables.
- The rest of the tables are moved to the walls, so that there is a lot of space to move around.
- Chairs can be adjusted by the students to be suitably placed for game-playing.

Agenda

(1) Introduction (5 min):

- Aim: Participants get an overview about the room, the setting, and the timeframe and get focused on conflicts and emotions.
- Description: The teacher introduces the setting and lets participants know that they can freely explore and play the game for approximately 1 hour. The teacher explains that they can choose which games to play, with whom, and how long for, **and** mentions societal and communal conflicts and personal emotions.

(2) Villages Voices session (55 min)

- Aim: Participants can enjoy playing Villages Voices together and can encounter each other without any teacher input and evaluative performance pressures and may already talk about societal and communal conflicts and personal emotions.
- Description: Participants take part in a non-regulated session and are offered to play Village Voices, provided on laptops. All laptops are set up on a table accessible to everybody, so that participants can freely choose what, when, and with who they want to play.

(3) Reflective debate (30 min):

- Aim: Participants can talk about their experiences in the Villages Voices session and connect their experiences to societal and communal conflicts and personal emotions.
- Description: A narrative-Socratic dialogue debate (see section above) takes place.
    - Generative phase: deals with the gameplay. Questions should motivate students to freely talk about the Villages Voices session. What happened during the gameplay: Describe from the beginning until the end. What did you experience? How did you play the game? Who was playing with who? When did a new interaction or a change of playing partners occur?
    - Immanent phase: The teacher reiterates aspects from the generative phase that has already dealt with societal issues (if any): what kind of social issues appeared and why? How was this connected to the gameplay? Why do the participants drop the discussion about the social issue? If the teacher notices a high-tension issue, it is worth asking further questions about it in plenum.
    - Exmanent phase: The teacher can bring in additional societal challenges that are interesting to him/her.

8. Teacher Training (O4)

The teacher training aims to facilitate students' and teachers' social and civic competencies, civic awareness, initiative, creative problem solving, and socially informed decision making via informed teacher training courses. The phase ensures the development of key dedicated European schools and stakeholders for the final evaluation of the project outcomes.

For these purposes this section presents **core aspects of future teacher training scenarios** that are based on specific objectives, topics, technologies, skills, and learning outcomes (as mentioned above) to inform the teacher training (O4).

In the second half of the eCrisis project, the strand of work focused on teacher training (O4) will build on and integrate the first outcomes of the project, i.e., the conceptual and methodological basis provided by the present framework, as well as its elaboration and exemplification through the development of the Educational Toolbox (O2) and Teacher Guidebook (O3).

By acquainting primary and secondary school teachers from diverse educational contexts in Europe with the innovative proposition made by eCrisis, the project go from the phase of design of the eCrisis solution to that of materialization in the realm of everyday educational practices. To this end, O4 will consist in the development of an innovative intervention for continuing professional development addressed to teachers, school leaders, and teacher trainers, aiming to enable and facilitate educators not merely to adopt the eCrisis approach but also to actively implement it in their professional life by creatively adapting it into their own educational contexts. Teachers will be presented with, and practically engage with all aspects of the eCrisis framework.

Teacher education curriculum design concepts will inform this work, covering diverse aspects such as the role of teacher, materials, resources, and classroom learning activities, as well as organizational considerations such as location, time, grouping, and assessment.

An important aspect of the eCrisis teacher training will be its gameful design, so that it can deeply involve educators in considerations of the potential of game-based learning, turning them into active agents not only using ready-made designs but actually designing their own gameful teaching and learning activities within the context of eCrisis.

Key features of the training course will include online learning materials and tools for interaction; workshops for discussion and reflection; simulations of learning sessions; hands-on project work, and involving teachers in preparing learning projects to implement in their own classes as well as reporting on the results. The eCrisis training courses will be tested and validated in the participating countries (Malta, Greece).

9. Mixed-method Evaluation Methodology (O5)

This section outlines the eCrisis research methodology that will be followed to evaluate the project: Basically, it will be "eCrisis in the wild". We envision using a mixed-methods methodology (Greene 2007) to cover the various parts of O5. Both qualitative and quantitative methods are described in what follows, and will be implemented from month 26 to 33 (1.11.2018–31.05.2019). The research undertaken for the eCrisis Framework has led to the results outlined above and to the qualitative research elements of O5. Additionally, quantitative evaluation methods and methodologies will be implemented in O5, as exemplified below.

The eCrisis mix-method evaluation methodology focuses on:

- The success of the teacher training workshops, considering in particular (1) the applicability for teaching practice(s); (2) satisfaction of participants (teachers as well as students), and (3) the quality of the workshop material.
- Game-based activities in schools and informal educational gaming competitions. This reports on the extent to which all formal and informal educational activities (1) were successfully utilized in conflict resolution, creative thinking, and reflective debating; (2) improved digital media literacy competences, and (3) provided tools to deal with unprecedented everyday real-life problems in a creative and responsible manner.

For these purposes this section presents the mixed-method **evaluation methodology and methods** to inform "eCrisis in the wild" (O5).

9.1. The Qualitative Elements of eCrisis Evaluation

O1 implemented an inclusive research approach (see Walmsley & Johnson 2003; Koenig & Buchner 2011; Nind 2014; von Unger 2014; Kremsner, Buchner & Koenig 2016), and this also provides the basis for further planning, data collection, and (partially) analysis. O5 ("eCrisis in the wild"), will follow an inclusive approach and will therefore play a fundamental role in the general evaluation of the project: O5 complements O1.

Inclusive research can be defined as research that includes or involves non-academic people. In IO1, this means refugees, students, teachers, and people with disabilities and learning difficulties, as well as people who are affected by social exclusion. These groups are involved in the whole process of I01, from the development and framing of research questions, data collection and analysis to dissemination (Walmsley & Johnson 2003). The evaluation planned for O5 has to fall within the context of the eCrisis project. The leading principle of inclusive research is to do research with, rather than on people, with a focus on collaboratively sharing expertise, experience, and skills, all under careful consideration of ethical guidelines. By doing

so, deep insights into basic knowledge about social inclusion, game playing in general, and digital games in particular by those addressed by the eCrisis project were (for IO1) and are (for O5) expected.

For IO1, the Viennese research team planned and held a kick-off workshop on September 1, 2016, to initiate further collaboration with stakeholders and people addressed by the project. During the course of this workshop, non-academic people (particularly people with learning difficulties) voluntarily, according to their own demands and to varying extents, joined the research team. Others followed in the course of further activities. Further research steps—particularly school visits and workshops—were planned collaboratively, with outcomes that exceeded not only in density and depth, but first and foremost in applicability. The plan is to invite the same people to take part in O5.

In addition to teachers and students, O1 also included key stakeholders—e.g. the Vienna School Board; Centres for Special Educational Needs; Mobile Intercultural Teams (MIT); refugee-camp providers, and self-advocates—at different stages of the research. Along with additional participating key stakeholders in Greece and Malta (see section “key stakeholders”) the same stakeholders will also participate in O5. Evaluation 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 the requirements of practitioners and those affected by crises. Thus, all interested stakeholders were kept up-to-date and get insights at their request to ensure that all relevant aspects are included as they arise. Demanding participation not only in selected areas but also in design, formulation of research questions, analysis, and dissemination can also be experienced as empowering and as an important part in emancipation. But most importantly, regarding O5, this approach also leads to a low-threshold offer, as it enables those involved—especially teachers—to easily return to the games and materials provided, use them in schools, and relay feedback to research team members. Their involvement is therefore key in evaluating the eCrisis project.

The use of a “stage model of participation” (von Unger 2014, see below) reveals a shift from “instruction” (stage 2: non-participation) to “partial decision-making power’ (stage 7: participation). This level of participation will be pursued throughout the eCrisis project and will play a fundamental role in O5.

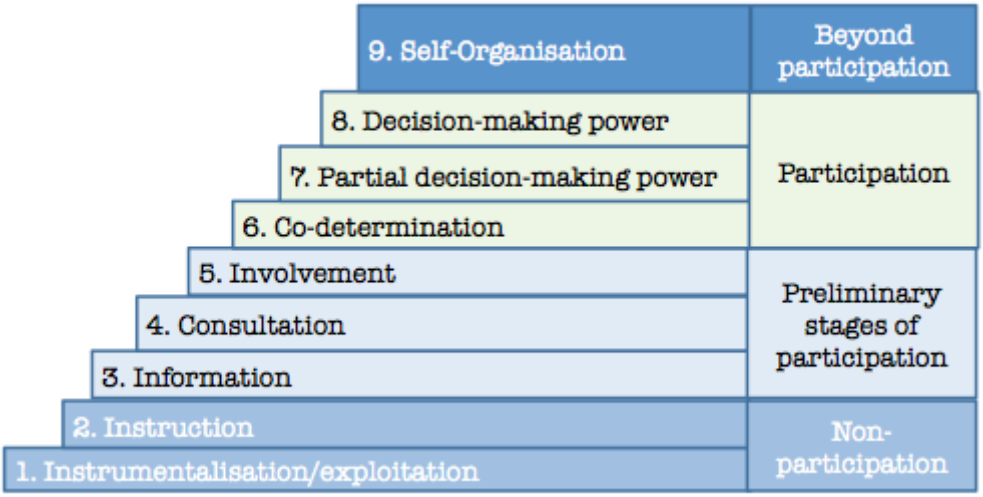

Figure 1. Model of stages of participation (von Unger 2014, 40; translated by the authors)

O5 will tie up on research methods already applied in IO1. These are:

- Participatory observation (Flick 2007; Lamnek 2010)
- Problem-centred interviews (Flick 2007; Lamnek 2010)
- Reflective debate, such as Socratic dialogue (Stenning et al. 2016) and narrative-Socratic dialogue (Schmoelz 2017)

For the analysis of data, O5 will employ situational analysis (Clarke 2005 & 2009), which is a qualitative research approach that combines a grounded theory methodology (GTM) with discourse analysis. The aim of situational analysis is (1) to identify the social arenas on which a specific situation is located and related (such as the social situation of the participants at the time of and within the data set), as they all mutually influence and constitute the situation and its actors (Clarke 2005). This approach proved to be particularly applicable for issues that focus on social inclusion and its opposite social marginalization/exclusion, as discourses influence and constitute every specific situation. Situational analysis maps non-human and human, as well as material and symbolic elements of any particular situation (in our case, e.g. participatory observations, reflective debates, and problem centred interviews) and their relations, allowing 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

marginalization/exclusion while simultaneously exploring creative methods and tools for social inclusion.

Based on the outcomes of the research in IO1, and its continuation in O5, further steps will lead to quantitative evaluation and measurement, which will be described in the next section.

9.2. The 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. In this section we outline methods for quantitatively evaluating the outcomes of the re-designed games for the purposes of the eCrisis objectives for each game. In particular, we focus on questionnaires directed at educators and learners, as well as in-game data collected per game. We conclude the discussion by raising potential questions that might be answered by the quantitative evaluation framework of eCrisis, complementing the qualitative approaches outlined above.

9.3. Village Voices

Learner questionnaires: The game is about conflict resolution, thus the design of a potential questionnaire will emphasize constructs related to conflict (an aspect easily tied to situational analysis, as shown above). Earlier experience of the consortium under the evaluation of the SIREN project has identified the Thomas–Kilmann Conflict Style (TKI) Questionnaire (Thomas & Kilmann, 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 children, broadly used in the SIREN project evaluation. We plan to use versions of the TKI across various time windows throughout the O5 phase of eCrisis. We will thus identify and analyse differences in learner conflict styles over time. In addition to TKI, learners will regularly be asked to self-report on the level of conflict during the game. Further, they will be asked to indicate their current emotional states and express feelings for the other players every time a major event occurs (e.g. trade, stealing, etc.). Finally, the game tracks the demographic data of the players (age, gender, location, experience with games, etc.).

Educator questionnaires: Similarly to learners, the eCrisis educators will be using versions of the TKI to cluster their students' conflict resolution styles over time. The styles derived from learners' self-reporting and teachers' reports will be correlated. Educators will most likely define the *ground truth* of conflict styles, and their reports will be used to validate the self-reports of learners. This aspect can 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 from particular players, classes as a whole, or even countries as a whole, we will be able to derive the temporal effects of using the game with regards to the player's emotional states, and the game's conflict levels, and associate these data with the conflict styles of the players, as described above. Cross-country/cultural/gender analyses are also possible given these datasets.

9.4. Iconoscope

Learner questionnaires: Repeatedly taking into account the inclusive research approach, we follow a peer-evaluation methodology for evaluating creative thinking in Iconoscope. Through Iconoscope's 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 former results in average rating values per Icon. The latter votes/guesses are aggregated into correct and wrong votes, which are then used to calculate the ambiguity score of each Icon. The ambiguity score is a direct measure of creative (diagrammatical) thinking.

Educator questionnaires: At this phase of the project we do not envisage the use of questionnaires for educators, but we plan to revisit this issue prior to the final design of the O5 eCrisis evaluation framework.

In-game data: 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.
- Key game events, such as new icon, change of colour, moving icons, use of assistants, and disregard of assistants. The timestamps of these events are also tracked.
- Assistants: we track their suggestions, which ones were selected, which ones were disregarded.
- Ambiguity score of each Icon.
- Number of (correct or wrong) votes for each Icon (popularity).
- Average rating of each Icon.

In summary, given the in-game data we can track in Iconoscope we can fully recreate the gameplay of each session (design of each Icon). By collecting data over time for particular players, concept triplets, classes as a whole, or even countries as a whole, 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. Location/language/cultural/gender analyses are also possible given these data.

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