My Dream Theatre: Putting Conflict on Center Stage

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ABSTRACT

Learning environments must weave content and practice from different areas of expertise to achieve success in the end. In this paper, we describe the approach taken in the design of a serious game aimed at teaching children about conflict resolution. We address the issue of including users, both teachers and children, in the design process and the indispensable multidisciplinary effort to put together a tool that suits learners needs. The paper highlights the decisions throughout the design due to the different perspectives we wanted to incorporate in the game. These include research on conflict theory, user participatory research and game design. By reckoning that all the perspectives are equally important, we insure that in the end we will have a solid game which fine-tuned mechanics will support its serious purpose.

Categories and Subject Descriptors

K.3.0 [**Computer Uses in Education**]: General; I.2.1 [**Applications and Expert System**]: Games]

General Terms

Theory, Design.

Keywords

Serious Games Design, Education, Conflict.

1. INTRODUCTION

A new generation of learners is growing up at a time when technology is part of their daily lives and is critical to the way they acquire new skills. Fostered by the pervasive influence of these computer interfaces, game learning environments are considered to have an untapped potential for education [8, 15]. This is the case for the so-called *serious games*, which use the advantages of a virtual environment either to encourage behavioural and social change or to promote a safe setting in order to explore a complex issue, to mention a few examples [17].

The focus of our project is on creating a new kind of educational tool aimed at encouraging behaviour change in children's conflict resolution. Conflict is a normal part of everyday life and it should be considered as a constructive process that enables society to move forward. According to this view, being able to manage conflict in an effective and independent way [16] is a social skill that should be internalized early in life [19]. Using a game as a vehicle to convey awareness about the deep structure of conflict can prompt children with an engaging tool to explore others' points of view, experience the consequences of their actions, and learn new ways to interact.

The engaging nature of game-based environments, however, is not enough to meet the educational goals. For a serious game to be successful, it is essential to ensure liaison between content and gameplay as a pathway to establish specific learning outcomes [10, 12]. This is a core challenge when developing such tools and it can be accomplished by having a well articulated multidisciplinary team (i.e. domain experts, game designers and developers), who draw upon knowledge from different areas of expertise [10, 18]. In addition to this, users' socio-cultural activities are also essential to feed into the game design cycle as children need to learn in context [7]. Thus, it is important to have a good scaffold based on sound educational principles and theory balanced with respect to gamers' voices and their literacy in the subject, rather than relying on *adults'* preconceived ideas. Furthermore, researchers should also include teachers in the design loop to meet their expectations, for example toward ensuring that the game addresses curriculum requirements [11, 9]. Weaving it all together is hardly straightforward and the literature does not offer a recipe to follow.

In this paper, we intentionally employed a set of methods – namely interviews, cultural probes and visualizations, participatory sessions and gameplay testing – that helped us to address the aforementioned challenges during the conception and development of our serious game – "My Dream Theatre". We discuss how the methods we used helped us

address the different perspectives in the design of our learning environment and how the findings, from these applied methods, yielded insights that were translated into design decisions in our game. By adopting a multi-disciplinary effort in the design process, our aim is to guarantee to have a solid product that will foster children's ability to think differently about conflict.

2. BACKGROUND AND RELATED WORK

Throughout the literature there are several competing definitions of conflict. In this project, we focus on interpersonal conflict, and understand conflict as a dyadic event, part of an interaction between two opposing sides with a recognizable temporal duration [14]. Adding to that, we adopt Thomas' [20] view of conflict, where in very broad terms he describes it as "the process which begins when one party perceives that the other has frustrated, or is about to frustrate some concerns of his".

Unquestionably, conflict resolution is not about eliminating conflict (because sometimes this is not possible) but to use its constructive potential (i.e. to avoid the destructive aspects of conflict) [16]. Children must learn to be more effective and independent in handling conflict in order to find ways for non-violent conflict resolution and be more socially competent. With the view to teach such skills to children and to engage them in the subject, educational interventions in some schools have taken the form of peer mediation programs [13] or drama workshops [5]. In fact, these kind of programs have proven to have a positive impact on students' behaviour. Nevertheless, one possible shortcoming is that classroom settings are static and most of the time the intervention is not adapted to the individual learner's needs.

The use of games to teach conflict resolution is thus very appealing and that vehicle had already been explored. Games such as *FearNot!* and *Choices and Voices* are examples of computer-based interventions intended to discuss particular variations of the conflict phenomenon. *FearNot!* [2] allows children to explore what happens in bullying situations. Children take the role of an 'invisible friend' to the victim and throughout the game the user gives advice to the victimized character taking responsibility for what happens to him/her. The *Choices and Voices* [1] role-playing game deals with peer pressure management, ability to question poor advice or development of resilience to adverse influences. Interactive scenarios are integrated into a narrative, wherein the child makes decisions which have consequences in the story. Both games tackle conflict differently. The former addresses a severe (and specific) form of conflict while in the latter children are guided through right or wrong actions that create internal dilemmas. Although these two games are related to our aims, we intend to focus on teaching conflict and conflict resolution from a broader perspective.

To address this issue, we used Crawford and Bondine's [4] work as a scaffold. As regards content, the researchers underline two critical components that conflict resolution programs must entail: *principles of conflict resolution* and a *problem solving process*. To engage in effective problem solving, children need to be trained on the following abilities: *Orientation* (understand concepts such as justice, tolerance, self-respect, etc.), *Perception* (understand that parties may differ on how they perceive the situation), *Emotion* (understand how to communicate and express emotions effectively), *Communication* (acquire behaviours to effectively exchange facts and feelings), *Creative thinking* (find solutions that could be mutually beneficial) and *Critical thinking* abilities (recognize and establish objective criteria based on which future behaviours may be planned).

3. LEARNING SCENARIO

The proposed work strives to create a safe environment where children can test and experiment with various responses to conflict that they can later apply when they encounter conflicts in the real world.

3.1 Concept

"My Dream Theatre" (MDT) is a single player game designed to prepare and teach 10 to 12-year old children conflict resolution skills. In MDT, the player takes the role of the director of a school theatre club, and has to mediate several conflicts during a full season. Each season is composed by several rehearsals and live performances. The success of the player in MDT relies on her ability to help the actors overcome each conflict situation in the drama club in order to orchestrate regular successful plays during the season.

In MDT, the player manages the actors, their needs and the conflicts between them. One of the main ideas of the concept, therefore, ís the existence of Non-Player Characters (NPCs) representing the actors in the school's theatre club who need to work together to set up the best possible performance. Each actor has certain personal stats, such as gender, performing skill, role preference and conflict resolution style, which will influence his/her behaviour. Not all actors can be assigned to their preferred role, and conflict will emerge between actors as a result. When conflicts emerge, the player is tasked with mediating the conflicts as seen suitable by employing a set of actions available. If the player continuously allows the conflicts between NPCs to escalate, they will reach a rupture point and the NPCs will deal with the conflict as they see fit, which will cause unexpected events that go beyond the control of the player.

3.2 Serious Messages

We believe that children should be prepared at the readiness level, as suggested by Kreidler [16]. Some conflict resolution skills are difficult for young children to grasp. Therefore, when teaching these concepts, one should focus on preparing and giving them tools they can use when they are ready. Hence, much of the effort should be placed on **broadening children's vocabulary** and on making them **conscious** of the semiotic elements of conflict. In addition, the game should convey the **positive side of conflict** – conflict can be constructive depending on the actions we take.

MDT focuses on a subset of the conflict abilities describes in section 2. It aims to support the training of **critical-thinking** in conflict situations by giving children tools to analyse, hypothesise and evaluate possibilities. In that sense, activities should help them see the cause and effect of specific actions and heighten their awareness around the choices they make. Furthermore, the game also aims to develop **perceptual** and **emotional** abilities.

This includes being able to **perceive** and reason about others' **perspectives** and understanding that people may have **different ways of handling** conflict. To achieve this, children will be required to mediate conflicts (*problem solving process addressed*) between the game characters. They

will have to learn to gather perspectives, identify interests that are contributing to the conflict and find better ways to cope with the situation (*principles of conflict resolution* highlighted by [4]). Moreover, a core component of any conflict is **emotion**, and it is the intense emotions associated with conflict that make children feel so overwhelmed and lacking control[16]. Experiencing these emotions, however, is normal and natural. As such, **being sensitive to these emotional changes** in others is essential to master conflict resolution. Since children will often not realize they are in a conflict until it has escalated to an extreme [16], helping them understand how conflict appears and **escalates** is an important part of the learning process.

4. TOWARDS "MY DREAM THEATRE"

Design challenges in learning games include balancing educational principles, users' practices and literacy, fun and engagement. These features must be congruent with game content and mechanics. With the view to address these challenges, researchers such as Good and Robertson [9] or Gunter et al.[10] have highlighted a set of strategies which they argue promote the creation of an effective learning environment, which we have found relevant in our research: *1) Basing design efforts on a sound theoretical scaffold.* This is summarized in section 2;

2) Intertwining game mechanics with the content to be taught – (This is described in section 5 which takes into consideration both literature and findings from user research);

3) Including teachers and children in the design process in order meet their expectations, practices and literacy. This was done through interviews, cultural probes, participatory sessions and playtesting;

4) Balancing team members' needs for a more successful outcome, as novel ideas may arise from the interaction between team members – probes visualizations aim to tackle this issue.

In this section, we report and discuss how we tried to meet the requirements.

Research with children was carried out in one school in country A over a period of 2 years. In total, 49 children (per year) aged 10 to 12 years-old participated in the studies. Opt-out consent forms were provided to all parents or guardians of those children.

4.1 Interviews with Children and Teachers

4.1.1 Aims and Methods

To enrich our understanding about children's practices in conflict situations, we conducted semi-structured interviews. The interviews were divided into two parts: a warm-up phase where kids were asked to discuss their favourite computer games with us and a core phase where they described conflict episodes experienced as an *observer*, *perpetrator* (*describe a situation wherein someone got angry with you*) and *victim* (*describe a situation wherein you got angry with someone*). The methodology employed in the interviews is a replication of a study previously conducted in the UK, reported by Vasalou, Ingram and Khaled [21]. The core part of the interviews was designed to extract rich narratives of conflict episodes. We asked children to provide details about conflict triggers, resolutions and outcomes. Additionally, we were interested in their feelings during and at the end of such conflict episodes (refer to [21] for more details).

Two teachers at the same school were also interviewed. Our aim was to understand their experience in dealing with conflict on a daily basis, how our game could help them and how it might be effectively incorporated in the classroom.

4.1.2 Key Findings

Our interviews with children were a good starting point to understand their practices and to get to know their main concerns. However, given that this was their first contact with the researcher, we observed that children were not always at ease in sharing sensitive information. Generally, we found that children consider conflict difficult to define and their vocabulary is rather limited when describing such episodes. Often they do not realize they are in a conflict until it has escalated into a fight. When the potential conflict becomes salient, they have difficulty in identifying its antecedents and consequences.

Turning to our interviews with teachers we found that they have to deal with minor conflicts and their strategy essentially focuses on preventing the situation from escalating and disrupting the class. One of the teachers noted: "*I always try to talk to them first, so that they understand what really happened and why they had a certain reaction, however this will only work with certain children. Sometimes I try not to make a big deal out of it to prevent the situation to become worse.*". When a quick-fix is not effective, teachers will activate the "*power chain*" within the school. The parents are seldom informed of such episodes and are only notified in severe occasions. Our second teacher claimed to discuss class problems with children during a dedicated time slot, suggesting that conflict episodes tend to affect the whole class dynamics.

Both teachers believed that a game should depict situations with which the children can identify themselves. One teacher argued that "*children already know what the solution is, but they do not know how to act and the game should help them on that*".

Teachers generally lack support, time and educational resources to carry out conflict resolution programs (this echoes what was found in the UK [21]). Particular to Portugal, schools rarely have resources to devote time to social learning. When they are willing to allocate time to such initiatives, as is the case in the school we worked with, teachers unfortunately lack the know-how to teach emotional and social learning. Thus for a game to be accepted by the school and to be effective, researchers will have to provide adequate training to teachers and ensure that the tool is easy to interact with and can adapt to their needs.

4.2 Conflict Probes and Visualizations

4.2.1 Aims and Methods

An adaptation of the Cultural Probes created by Gaver et al. [6] – *Conflict Probes* – was employed with the aim to collect sensitive information about children's individual feelings and behaviours in situations they identify as important.

The adaptation of the method was markedly influenced by conflict theory and a previous study carried out by Berkovich [3], in which she applied the *Perspective Probes*. Similarly to what Berkovich did in her study (about Google finance), we broke down the conflict topic into small units to address elements of the phenomenon without asking about conflict directly.

The probe pack (figure 1) encapsulated the semiotic elements of conflict and was composed of seven self-contained tasks around the five dimensions of the phenome- non: *participants*, *causes*, *strategies*, *resolutions* and *outcomes*. The tasks were designed to create an evolving interaction with the user by increasing the level of ambiguity as the participant explored the package:

Task 1 - Social Network. The first task asked about participants' emotional links to other children at school, and captured their familiarity with different emotions.

Task 2 - Feel. Complementing the first task, the second task intended to capture triggers of emotions other than anger, which is the emotion most frequently reported during conflict. Children were asked to enumerate situations during which they had felt sad, happy or scared.

Task 3 - You're the writer. Children wrote the ending to a story about a resource dispute. This task explored perspectives on conflict resolution that may be influenced by personality differences.

Task 4 - Bubbles. Children were given a set of words which they needed to use in order to *temporally* describe a conflict. This activity allowed us to explore how children view events that lead to a conflict situation, as well as what happens in the aftermath.

Task 5 - Thermometer. What makes children get angry is likely to vary greatly. This task was designed to measure differences in anger intensity, by asking children to rate situations and their triggers using an "anger thermometer".

Task 6 - No Rules. Children were asked to think about conflict and what it means. Using the provided materials, they were asked to depict a situation during which a conflict happened or might happen.

Figure 1: Probe pack

As discussed earlier, the interdisciplinary challenge of weaving content and practice can lead to new opportunities that should be considered in the early stages of design as this can increase the likelihood of developing a successful game [12]. With a view to address this issue, we extended the "cultural probes' experience" to the remaining multidisciplinary members of the team, by creating a set of visualizations, which aim to capture the main characteristics of the probes' tasks and transform the physical artifacts into digital form. The aim of this approach is to promote disciplinary convergence by encouraging discussion, critical thinking, and creating detachment from previously acquired knowledge and/or patterns. Its main principles are:

a) visual artifacts share a tight connection with the original structures (figure 2);

b) interaction is a process that allows the user (in this case, other team members) to explore data in parts and thus, transform the conceptual space (figure 3 provides an example);

c) the graphical shapes do not consider the gathered information explicitly and thus do not impose an interpretation on the data presented. Exploration provide access to qualitative values and never quantitative ones.

In our view, visualisations respect the ambiguous and uncertain nature of the probe returns. They also provide designers with a brainstorming tool featuring different types of interactions that encourage further reflection and support 'in time' decisions.

4.2.2 *Key Findings*

Conflict Probes played a reinvigorating role in our preinventive design phase. The theory that grounded the tasks' structure gave us the opportunity to learn about conflict. It also helped us understand how conflict can be explained to children, which had a direct effect on the design of the game. The probes' returns verified our earlier findings in showing the unsophisticated knowledge children have about conflict and the difficulty they face in recognizing its various dimensions as part of a coherent whole. Furthermore, the visualizations allowed us to convey children's experiences to other team members while ensuring that the ambiguous and uncertain nature of the probes returns remains intact. We found that the tool transformed the data space, supporting a shift in our perceptions whilst opening the space for critical and creative thinking. We believe that this approach can be easily extrapolated to other design projects that demand disciplinary convergence by creating common ground.

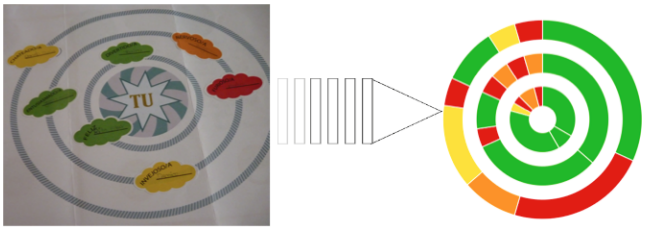

Figure 2: Task 1 - Social Network. From physical to digital artifacts

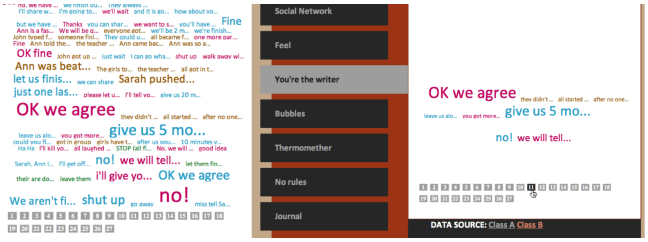

Figure 3: Task 3 - You're the writer. Words are the main element of this task. It is possible to explore each story individually by interacting with the visual forms as shown in the right-hand side of the figure.

4.3 Participatory Sessions

4.3.1 Aims and Methods

MDT uses the Thomas-Killmann [20] conflict model to draw children's attention to ways of coping with conflict other than fighting. Although conflict learning programs foster win-win solutions, other types of conflict handling modes are also appropriate depending on the situation. Focusing more on the characteristics of specific conflict behaviours, Thomas and Kilmann [20] presented a model that generalizes the approaches for handling conflict in terms of: *assertiveness* and *cooperativeness*. The former describes attempts to satisfy one's own concerns, while the latter describes a focus on satisfying the other's concerns. These dimensions create a two-dimensional space described by four conflict handling modes: *appeasement*, *neglectful*, *domination*, *collaboration* and *compromise*. Given the clarity and simplicity of this taxonomy, we mapped Thomas' model [20] to some of our game mechanics.

Participatory sessions were conducted with the purpose to identify visual symbols that could effectively communicate each one of these strategies to children. This became a vehicle through which we learned about children's understanding of these terms.

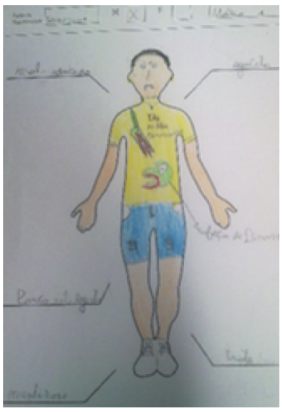

Figure 4: How a child would look like if her behaviour was classified in the category *dominate*

4.3.2 Key Findings

The participatory sessions revealed that children had distorted views of concepts proposed by our theoretical model.

The words children claimed to know were *collaborate* and *dominate*, while the remaining coping modes were not as yet part of their vocabulary. This reinforced our conviction to broaden children's vocabulary on conflict resolution. Moreover, words such as friend, kind, lovely, genius, smart, creative and intelligent were attributed to collaborative behaviour.

Children, in general, did not see collaboration as the ideal way to cope with conflict. In their view, collaboration meant losing something to the other party. They reduced the model's bi-dimensional space (assertiveness and cooperativeness) to a win-lose dichotomy. In addition to this, the time frame between conflict and its outcomes was perceived to be short. Short-term gains were more important than long-term ones. For example, a character sharing a resource with another, was seen as being cooperative and not assertive, given that during that specific moment she was not getting everything she wanted.

Finally, children associated negative symbols with behaviours expressing dominating and neglectful strategies. This suggested that the game should support the additional perspective that there is not one best strategy. Depending on the context all strategies are valid.

Overall, participatory sessions helped us focus on the most important serious messages to be conveyed through the game by providing supporting evidence. An ancillary finding was that children were able to articulate reasons for their choices during a reflection phase that took place after the participatory sessions. They were also able to provide better answers when they thought they might be wrong. It is thus extremely relevant to incorporate after-game reflection sessions to crystallize their experiences in the game. The teacher plays a fundamental role in this.

4.4 Gameplaytesting a Low Fidelity Prototype

4.4.1 Aims and Methods

The game was iteratively tested using a low-fidelity prototype (LFP) – i.e. a card version of the game (figure 5) – in a total of 20 testing sessions lasting 45 minutes each, over a 5-week period. The aim was to ensure that the flow of the game was smooth, to address whether the game was fun and to gain insight into the actions the players may want to take during gameplay (and why). Children played the card game in pairs in order to encourage discussion and interaction. Constructing such a collaborative setting was ideal for eliciting as much feedback as possible. A researcher supervised the sessions. The researcher was present during the setup of the game, offered children support throughout the game session and collected their reactions and comments. Each session consisted of one round. Due to time constraints, 38 children participated in the study (18 girls and 20 boys), 8 of them playing the game twice. Each testing session (figure 6) began with a brief explanation of the theatre metaphor and included a recap of key concepts and keywords crucial for understanding the purposes of the game. After these instructions were delivered, the main game elements such as actors, personalities, conflict and mediation, were explained in detail along with the game mechanics. A summary of the rules was also provided.

Figure 5: Snapshot of the low-fidelity card prototype of "My Dream Theatre"

Figure 6: Two girls during one of the playtesting sessions

4.4.2 Key Findings

This stage was extremely important in verifying whether the mechanics were working for or against the serious messages that we wanted to communicate through our game. Observations of children's reactions along with their comments and suggestions led us to make several changes in the prototype. These changes concern not only the balance of the game, but also the addition of new elements which we felt better conveyed our serious messages.

5. WEAVING IT TOGETHER

In this project, conflict theory, user research and principles from game design were three simultaneous forces that shaped the development of MDT. In this section, we describe how these forces shaped the different game mechanics and how these mechanics support the serious messages the game intends to convey.

5.1 Game Core Elements

There are three core elements in the game – *actors*, *mediation actions* and *external events* – that together encapsulate game mechanics aimed at meeting our learning objectives.

5.1.1 Actors

The theatre club is constituted by a set of actors. This line-up remains the same throughout the game. The player cannot fire or substitute an actor when things start to fall apart: she has to deal with the different conflict situations appearing throughout the game.

Actors have an individual identity. They have a name, gender and a distinct appearance. This establishes different identities for the actors, fosters a connection with the player, and makes it easier for the players to talk about the game, in post-game in-class discussion sessions.

Actors' preferences are the basic mechanic to generate conflict. The actors have individual preferences about the roles they would like to perform (e.g. villain, hero, sound engineer). Actors who share some preference (e.g. 'like music'), also share a social identity and are thus assumed to belong to the same group, facilitating certain types of interactions. There are different roles, but one is particularly problematic: the *figurant*. Disliked by all, it has to be attributed to an actor. In MDT, roles are the object of dispute and cause conflict to emerge, as it is not possible for all actors to perform their ideal role.

Actors' acting skill is the measure of success. Acting skill determines how good an actor is at acting the rehearsed role. Actors can increase their acting skill in a rehearsal, but only if they are not in conflict with others, as the emotions aroused by conflict can cloud their mind and impede them in developing their acting skills. Because shows are scoring events that happen regularly after a certain number of rehearsals, and because the game rewards the player based on the acting skill of all actors, the game ensures that conflict resolution is mandatory for the player to succeed in the game.

Actors' conflict resolution skill supports the notion that conflict can have positive outcomes. Playtesting quickly emphasized the fact that children saw themselves as having to repeatedly solve the actors' problems. Besides the fact that this was not a fun experience for them, conflict was understood as a clearly negative event. To support the message that conflict can also have a positive side, we provided actors with a conflict resolution skill, allowing them to solve (to a certain extent) conflicts on their own. When the player helps the actors resolve their conflicts in certain ways, their conflict skill increases, and actors progressively become more proficient at resolving their own conflicts without intervention from the player (mainly those that happen outside of the rehearsal). This mechanic emphasizes actors' **progression** in terms of their conflict resolution skills. Expert players will learn to let conflict situations arise for the actors in order to build up their skills and progress quicker in the game. Additionally, **the actors' conflict resolution skill supports the dynamics of short-term versus delayed rewards**, helping children better understand the time frame between conflict and its outcome, and to realize that long-term benefits may be more important than short-term gains (the participatory sessions showed that children understand conflict in a very narrow time frame).

Conflict level and emotional threshold explicitly represent conflict escalation and different tolerance levels between individuals. Understanding conflict escalation is a critical aspect of conflict resolution. Actors have a conflict level that will increase as conflict situations appear and decrease as they are resolved. Each actor also has an individual emotional threshold, representing the actor's tolerance to adversity and is graphically described as a **thermometer**. This represents a limit that, when reached, will make actors lose their temper and act according to their conflict personality. This resultant action (e.g. an actor leaving the rehearsal and taking all her friends with her) is unexpected from the cast's point of view, and usually undesirable for the player. This is an element directly extracted from the probes tasks and represents the fact that if a conflict situation is not handled properly, it can escalate to an unbearable level and have consequences for the self and others. From the conflict probes, we learned that anger progression is not a concept well understood by children. This mechanic aims to explicitly represent the emotional charge of events and emotion escalation, which the player must control to guarantee that unexpected events will not occur.

Actors have individual conflict resolution styles. Different people react differently to conflict situations. Conflict resolution styles were directly extracted from the theory

[20] of conflict resolution (as described in the background section) that captures the different styles of handling conflict. The theory proposes that there is no best way to deal with a conflict, and the mode of resolution has to be adapted to each situation. The conflict resolution style is mapped to the actor's personality, which is characterized by *assertiveness* and *cooperativeness*, and action tendencies in response to conflict situations: *neglect*, *appease*, *dominate* and *collaborate*. Actors, depending if they are assertive or cooperative, will display a different behaviour either when conflict situations occur or as a response to mediation actions. The participatory sessions indicated that although words used to express conflict resolution styles are not part of children's vocabulary, the model is adequate to communicate to them our main message.

5.1.2 Mediation Actions

Conflict will emerge as a result of the actors' preference for specific roles. Because an actor was not attributed a preferred role, he/she will get in conflict with actors who did. As they get involved in conflict situations, actors' conflict level will elevate and they will respond emotionally.

The player's (essential) role is to mediate such conflicts before they escalate beyond the actors' tolerance level and provoke situation that will prevent the company from performing the shows that are being rehearsed (and as such prevent the player from increasing her score). To do that, the player has an array of choices at her disposal. The player can choose between: *not to intervene*; *talking to a single actor*; *asking two actors to talk to each other*; or *talking to a group of actors who share the same identity.*

The mediation actions will have different effects depending on the actor's conflict resolution style (and respective action tendencies). It is up to the player to understand which mediation action is the most adequate in a certain situation characterised by certain conflict resolution styles. To be effective during mediation, the player must understand the effects of being *assertive* and *cooperative* during resolution. The player is encouraged to experiment using different actions and to identify the right context in which an intervening strategy will have a maximum effect in terms of conflict resolution. For instance, *talking to a single actor* works better with *assertive* actors.If the player is able to maintain the actors' conflict thermometers at low levels (emotional de-escalation), their conflict resolution skill will increase as a result.

Overall, the mediation-related mechanics invite the player to experience a process of problem solving. To that end, the player must apply an objective criterion and focus on interests rather than positions, as proposed by the conflict education literature.

5.1.3 External Events

In MDT, conflicts do not only occur during rehearsals. In the week between rehearsals, external events involving the actors also occur. Inspiration for external events was extracted from narratives obtained during the cultural probes and the interviews. Such events may have happened during class or during recess and may involve two or more actors.

The aim of this mechanic is twofold. One the one hand, it creates a **link to real conflict situations** that the player may identify herself more easily with. On the other hand, the uncertainty element associated with this mechanic creates a certain tension in the game, as one is never sure of what can happen between rehearsals: **the player is never in complete control of the conflict situations**. Sometimes, unexpected things may worsen a situation in an unpredictable (but never critical if prevented) way.

It is important to note that this tension can be mitigated if the player has invested in developing the actors' conflict resolution skill by **using conflict as a constructive opportunity**. If actors already have that kind of skill they will be more capable of solving their own problems outside of the theatre club.

6. DISCUSSION

The decisions that took place during the design and development of the "My Dream Theatre" game were heavily influenced by a multitude of perspectives: **conflict theory** (models of conflict and education literature oriented to both children and adults), **user research** (interviews with children and teachers, cultural probes, participatory design sessions) and **game design** (gameplay development and playtesting sessions). By bringing together these three perspectives, our aim was to create a set of fine-tuned mechanics that weave it all together.

Returning to the "serious messages" outlined in section 3.2, our main goal is to prepare children at the readiness level by giving them tools they can use in the future. A starting point is to make them aware of the deep elements of conflict and foster their critical-thinking about conflict-laden situations. This entails understanding others' perspectives, the emotions ensuing from conflict and also being able to identify a range of solutions available that can be employed towards a resolution. In Table 1, we provide a summary of the methods we used, the type of information yielded by each method, its impact on game design and how it addresses key design challenges of learning games.

Table 1: Perspectives offered by the employed methods

	Contribution to MDT design
Theory	grounded models to inform different design decisions throughout the design and establish serious messages.
Interviews	generic information that allows us to establish vocabulary and compare our approach with current practices.
Probes	empathic link with children's common practices, emotions, perspectives on conflict.
Visualization	promotes empathic interpretation, multi-disciplinary convergence and detachment from any pre-conceptions.
Participatory sessions	concrete information that captures users' perspective over (detailed) concepts to be conveyed. Game mechanics were fined-tuned according to player literacy.
Playtesting	used to assess fun, flow, balance and messages in the game. Changes were made to meet educational messages.

As Table 1 suggests, in MDT, a theoretical scaffold was indispensable for pointing out design directions and guiding us

when constructing our study protocols (in particular providing guidance for the interviews, conflict probes and participatory sessions). Furthermore, theory inspired us to define a set of "serious messages" to convey through the game.

Users' perspectives, literacy and practices provided us with an overview of children's understanding about conflict and usual modes of handling conflict situations. Although children seem to be able to follow a recipe that was previously reinforced by parents and/or teachers to apply 'in time' solutions for 'in time' problems (teach children to share or apologize when they do something wrong), children hardly understand the underlying (deep) elements of such situations and the effects of their actions in the short and long term. This highlights that the game mechanics should foster thinking about the current and future consequences of their actions. Interviews and cultural probes allowed us to identify these issues from two different angles. While interviews provided general information about conflict episodes children experienced (themes, emotions, resolutions and outcomes), conflict probes (and visualizations) broke down the phenomenon into smaller units allowing us to empathise with children's views. During the course of the project, it became essential for us to communicate these views to other team members, by using methods other than written reports. We believe that all team members involved in the development must come closer to children's perspectives in order to create a detachment from any pre-conceptions. To address this issue visualizations of the probe data were created. The visualizations intend to encourage disciplinary convergence and promote discussion around ambiguous, uncertain artifacts that invite varied subjective interpretations depending on one's area of expertise.

This initial research was indisputably important, but subsequent phases were essential as well. After some initial ideas were translated into mechanics, we went on to verify what was working for children. In participatory sessions, we sought to get more concrete information regarding conflict handling modes. The sessions were guided to ask children specific questions relevant to our game design concept. In fact, we established that the way in which children perceive the handling-modes we presented will influence how they will play the game. Finally, playtesting sessions served to verify if the mechanics, in general, were straightforward and whether the right messages, as intended, were conveyed. Our main objectives were to get children's general impressions about the game – if they like it, if it is easy to understand, easy to play, how they understand the depicted conflict situations and also to verify the balance of the game and its mechanics toward a better game experience. We wanted answers to questions such as which conflicts emerged, are there dominant strategies and which ones were preferred by children, how high is the score they could achieve in a turn and so on. Using this information as a foundation, a digital prototype has now been developed.

7. ACKNOWLEDGEMENTS

The research leading to these results has received funding from European Community's FP7 ICT under grant agreement no 258453, by FCT (INESC-ID multi annual funding) through the PIDDAC Program PEst-OE/EEI/LA0021/2011 and scholarship (SFRH/BD/75342/2010) granted by FCT. We gratefully acknowledge Rilla Khaled, Charlene Hondrou and Kostas Karpouzis for their insights on this work.

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