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**ΠΑΝΕΠΙΣΤΗΜΙΟ ΔΥΤΙΚΗΣ ΑΤΤΙΚΗΣ**  
**ΣΕ ΣΥΝΕΡΓΑΣΙΑ ΜΕ ΤΟ**  
**ΠΑΝΕΠΙΣΤΗΜΙΟ ΤΗΣ LIMOGES**  
**ΣΧΟΛΗ ΜΗΧΑΝΙΚΩΝ**

**ΤΜΗΜΑ ΜΗΧΑΝΙΚΩΝ ΠΛΗΡΟΦΟΡΙΚΗΣ ΚΑΙ ΥΠΟΛΟΓΙΣΤΩΝ**

**ΠΡΟΓΡΑΜΜΑ ΜΕΤΑΠΤΥΧΙΑΚΩΝ ΣΠΟΥΔΩΝ**  
**Τεχνητή Νοημοσύνη & Οπτική Υπολογιστική**  
**Κατεύθυνση: Σύνθεση & Ανάλυση Εικόνας**

[1]

Cyberbullying Symptoms and proper Response through an Educational Game in Unity.



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## **ΔΙΠΛΩΜΑΤΙΚΗ ΕΡΓΑΣΙΑ**

**Κυβερνοεκφοβισμός σε Νεαρές Ηλικίες Συμπτώματα και σωστή Αντιμετώπιση  
μέσω ενός Εκπαιδευτικού Παιχνιδιού στη Unity**

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**Αθήνα, Ιούλιος 2023**



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**UNIVERSITY OF WEST ATTICA**  
**IN COOPERATION WITH**  
**UNIVERSITY OF LIMOGES**  
**SCHOOL OF ENGINEERS**  
**DEPARTMENT OF COMPUTER ENGINEERING**

**MASTER OF SCIENCE**  
**Artificial Intelligence & Visual Computing**  
**Option: Image Synthesis & Analysis**



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## **Master Thesis**

# **Adolescent Cyberbullying Symptoms and proper Response through an Educational Game in Unity**

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**Supervisor: Eleni Mouri, Professor**

**Athens, July 2023**



**Κυβερνοεκφοβισμός σε Νεαρές Ηλικίες Συμπτώματα και σωστή Αντιμετώπιση μέσω ενός Εκπαιδευτικού Παιχνιδιού στη Unity**

**Μέλη Εξεταστικής Επιτροπής συμπεριλαμβανομένου και του Εισηγητή**

Η μεταπτυχιακή διπλωματική εργασία εξετάστηκε επιτυχώς από την κάτωθι Εξεταστική Επιτροπή:

<b>A/α</b>	<b>ΟΝΟΜΑΤΕΠΩΝΥΜΟ</b>	<b>ΒΑΘΜΙΔΑ/ΙΔΙΟΤΗΤΑ</b>	<b>ΨΗΦΙΑΚΗ ΥΠΟΓΡΑΦΗ</b>
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## ΔΗΛΩΣΗ ΣΥΓΓΡΑΦΕΑ ΜΕΤΑΠΤΥΧΙΑΚΗΣ ΕΡΓΑΣΙΑΣ

Η κάτωθι υπογεγραμμένη ΚΟΥΤΣΟΥΛΑΦΤΗ ΕΛΕΝΗ του ΔΗΜΗΤΡΙΟΥ, με αριθμό μητρώου aivc20010 φοιτήτρια του Προγράμματος Μεταπτυχιακών Σπουδών ΤΕΧΝΗΤΗ ΝΟΗΜΟΣΥΝΗ ΚΑΙ ΟΠΤΙΚΗ ΥΠΟΛΟΓΙΣΤΙΚΗ του Τμήματος ΕΠΙΣΤΗΜΗ & ΤΕΧΝΟΛΟΓΙΑ ΠΛΗΡΟΦΟΡΙΚΗΣ & ΥΠΟΛΟΓΙΣΤΩΝ της Σχολής ΜΗΧΑΝΙΚΩΝ του Πανεπιστημίου Δυτικής Αττικής, δηλώνω ότι: «Είμαι συγγραφέας αυτής της μεταπτυχιακής εργασίας και ότι κάθε βοήθεια την οποία είχα για την προετοιμασία της, είναι πλήρως αναγνωρισμένη και αναφέρεται στην εργασία. Επίσης, οι όποιες πηγές από τις οποίες έκανα χρήση δεδομένων, ιδεών ή λέξεων, είτε ακριβώς είτε παραφρασμένες, αναφέρονται στο σύνολό τους, με πλήρη αναφορά στους συγγραφείς, τον εκδοτικό οίκο ή το περιοδικό, συμπεριλαμβανομένων και των πηγών που ενδεχομένως χρησιμοποιήθηκαν από το διαδίκτυο. Επίσης, βεβαιώνω ότι αυτή η εργασία έχει συγγραφεί από μένα αποκλειστικά και αποτελεί προϊόν πνευματικής ιδιοκτησίας τόσο δικής μου, όσο και του Ιδρύματος.

Παράβαση της ανωτέρω ακαδημαϊκής μου ευθύνης αποτελεί ουσιώδη λόγο για την ανάκληση του πτυχίου μου».

Η Δηλούσα  
Κουτούλαφη Ελένη

(Υπογραφή)

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## ΕΥΧΑΡΙΣΤΙΕΣ

Η διπλωματική αυτή εκπονήθηκε στα πλαίσια του Μεταπτυχιακού Προγράμματος Σπουδών «Τεχνητή Νοημοσύνη και Οπτική Υπολογιστική» του Πανεπιστημίου Δυτικής Αττικής. Κατά τη διάρκεια των σπουδών που οδήγησαν σε αυτή την εργασία είχα την ευκαιρία να γνωρίσω καινούργιο κόσμο, έστω και εξ αποστάσεως, όπως και να αποκτήσω εμπειρίες και γνώσεις. Αισθάνομαι την ανάγκη να ευχαριστήσω όσους συνέλαβαν με τον τρόπο τους στην ολοκλήρωση αυτής της εργασίας. Πρώτα από όλα, τους Καθηγητές του Προγράμματος καθώς και του Limoges για την υποστήριξη και τις γνώσεις που μου μεταλαμπαδεύσανε.

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## ΠΕΡΙΛΗΨΗ

Η παρούσα διατριβή επικεντρώνεται στην ανάπτυξη ενός εκπαιδευτικού παιχνιδιού με στόχο την ευαισθητοποίηση και την παροχή πολύτιμων πληροφοριών σχετικά με το φαινόμενο του διαδικτυακού εκφοβισμού μεταξύ εφήβων ηλικίας 10 έως 14 ετών. Ο διαδικτυακός εκφοβισμός έχει γίνει ένα διαδεδομένο ζήτημα στη σημερινή ψηφιακή εποχή, θέτοντας σημαντικές ψυχολογικές και συναισθηματικές προκλήσεις για τα νεαρά άτομα. Στόχος της παρούσας έρευνας είναι η δημιουργία μιας διαδραστικής και ελκυστικής πλατφόρμας που όχι μόνο ορίζει τον διαδικτυακό εκφοβισμό, αλλά και διερευνά τις επιπτώσεις του και διδάσκει τη σωστή αντιμετώπιση.

Η διατριβή ξεκινά με την παροχή ενός περιεκτικού ορισμού του διαδικτυακού εκφοβισμού, λαμβάνοντας υπόψη τη δυναμική φύση του στο διαδικτυακό πεδίο. Εξετάζοντας την υπάρχουσα βιβλιογραφία και μελέτες, η έρευνα διερευνά τις ψυχολογικές, συναισθηματικές και κοινωνικές επιπτώσεις του διαδικτυακού εκφοβισμού στους εφήβους, αναδεικνύοντας τις πιθανές μακροπρόθεσμες συνέπειες στην ευημερία και την ανάπτυξή τους.

Επιπλέον, η μελέτη εμβαθύνει στα διάφορα σημάδια και τις εκδηλώσεις του διαδικτυακού εκφοβισμού μεταξύ εφήβων ηλικίας 10 έως 14 ετών. Εντοπίζοντας τις διάφορες τακτικές που χρησιμοποιούν οι εκφοβιστές στον κυβερνοχώρο, όπως ο αποκλεισμός, η παρενόχληση, η διαδικτυακή παρακολούθηση, το outing και η πλαστοπροσωπία, η έρευνα αυτή στοχεύει να ενδυναμώσει τόσο τους εκπαιδευτικούς όσο και τα νεαρά άτομα στην αναγνώριση και την αποτελεσματική αντιμετώπιση αυτών των επιβλαβών συμπεριφορών.

Η κύρια συνεισφορά της παρούσας διατριβής έγκειται στην ανάπτυξη ενός εκπαιδευτικού παιχνιδιού που χρησιμεύει ως διαδραστικό εργαλείο για την πρόληψη και την παρέμβαση. Μέσω μιας προσεκτικά σχεδιασμένης εμπειρίας παιχνιδιού, το παιχνίδι στοχεύει στην εκπαίδευση των εφήβων σχετικά με τις διάφορες πτυχές του διαδικτυακού εκφοβισμού, συμπεριλαμβανομένων των επιπτώσεων και των σημείων του. Εμπλέκοντας τους χρήστες σε σενάρια και διαδικασίες λήψης αποφάσεων, το παιχνίδι ενθαρρύνει την κριτική σκέψη, την ενσυναίσθηση και την υπεύθυνη ψηφιακή ιδιότητα του πολίτη.





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Η ερευνητική μεθοδολογία που χρησιμοποιείται περιλαμβάνει έναν συνδυασμό βιβλιογραφικής ανασκόπησης, εμπειρικής έρευνας και επαναληπτικών διαδικασιών σχεδιασμού παιχνιδιών. Η ανάπτυξη του παιχνιδιού ακολουθεί μια επαναληπτική προσέγγιση σχεδιασμού, ενσωματώνοντας την ανατροφοδότηση από τους χρήστες-στόχους, τους εκπαιδευτικούς και τους ειδικούς στον τομέα. Η αποτελεσματικότητα του παιχνιδιού θα αξιολογηθεί μέσω ερευνών, παρατηρήσεων και αξιολογήσεων γνώσεων πριν/μετά το παιχνίδι. Επιπλέον παρέχει αξιόπιστες πηγές, στις οποίες οι έφηβοι μπορούν να ανατρέξουν για περαιτέρω πληροφορίες.

Η παρούσα διατριβή στοχεύει να συμβάλει στον τομέα της εκπαίδευσης και της πρόληψης του διαδικτυακού εκφοβισμού, παρέχοντας ένα καινοτόμο και ελκυστικό εργαλείο για τους εφήβους. Με την ευαισθητοποίηση, την προώθηση της ενσυναίσθησης και την ενίσχυση της ψηφιακής ανθεκτικότητας, το εκπαιδευτικό παιχνίδι φιλοδοξεί να ενδυναμώσει τα νεαρά άτομα να αναγνωρίζουν, να προλαμβάνουν και να καταπολεμούν αποτελεσματικά τον διαδικτυακό εκφοβισμό.



## **ABSTRACT**

This thesis focuses on the development of an educational game aimed at raising awareness and providing valuable insights into the phenomenon of cyberbullying among adolescents aged 10 to 14 years old. Cyberbullying has become a pervasive issue in today's digital age, posing significant psychological and emotional challenges for young individuals. The objective of this research is to create an interactive and engaging platform that not only defines cyberbullying but also explores its effects and teaches proper response.

The thesis begins by providing a comprehensive definition of cyberbullying, considering its dynamic nature within the online realm. By examining existing literature and studies, the research investigates the psychological, emotional, and social impact of cyberbullying on adolescents, highlighting the potential long-term consequences on their well-being and development.

Moreover, the study delves into the different signs and manifestations of cyberbullying among adolescents aged 10 to 14. By identifying the various tactics employed by cyberbullies, such as exclusion, harassment, cyberstalking, outing, and impersonation, this research aims to empower both educators and young individuals in recognizing and addressing these harmful behaviors effectively.

The main contribution of this thesis lies in the development of an educational game that serves as an interactive tool for prevention and intervention. Through a carefully designed gameplay experience, the game aims to educate adolescents about the different facets of cyberbullying, including its effects and signs. By engaging users in scenarios and decision-making processes, the game encourages critical thinking, empathy, and responsible digital citizenship.

The research methodology employed involves a combination of literature review, empirical research, and iterative game design processes. The game's development follows an iterative design approach, incorporating feedback from target users, educators, and experts in the field. The effectiveness of the game will be evaluated through surveys, observations, and pre/post-game knowledge assessments. More over provides trusted sources, where adolescents can refer to for further information.



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This thesis aims to contribute to the field of education and the prevention of cyberbullying by providing an innovative and engaging tool for adolescents. By raising awareness, promoting empathy, and fostering digital resilience, the educational game aspires to empower young individuals to recognize, prevent, and combat cyberbullying effectively.

**Keywords:** Cyberbullying, Educational Game, Adolescents, Effects, Signs, Prevention, Intervention, Digital Resilience, Digital Citizenship, Unity, Serious Games, Educational Games, Games and Unity.

## CASE STUDY

**Link to the Game:** <https://www.newgrounds.com/portal/view/889935>

**Exemplary Video of the game:** <https://youtu.be/wrFaXivPYBQ>



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## CHAPTER 1

### Introduction

#### 1.1 Problem Description

Cyberbullying emerged with the widespread availability of computers in the consumer market during the 1990s. It has evolved into a significant issue, affecting not only children but also teenagers and adults. Cyberbullying and cyber harassment manifest in various forms, including cyberstalking, trickery, catfishing, trolling, dissing, and frapping. Extensive research has revealed that cyberbullying, as an extension of traditional bullying, encompasses multiple subtypes, influenced by factors such as the victim's sex, age, culture, disabilities, and visual differences.

While bullying was once perceived as a "normal" part of childhood development, numerous studies now establish a clear connection between bullying and adverse emotional, physiological, and behavioural outcomes. Victims often experience low self-esteem, depression, and health problems, while bullies themselves are more likely to have criminal records later in life. Remarkably, studies have found that cyberbullying produces similar emotional and physiological consequences as traditional bullying.

Considering these compelling facts, cyberbullying possesses significant negative implications for the development of adolescents. Furthermore, research on cyberbullying is still in its early stages, necessitating further investigations to gain a better understanding of this phenomenon, improve detection methods, and develop effective strategies for management and prevention.

In response to these challenges, this thesis aims to develop a multiple-choice game designed specifically for adolescents. The game seeks to enhance their understanding of cyberbullying, empower them to identify cyberbullying incidents, and foster awareness of the academic and mental health effects associated with such behaviour. Additionally, this thesis will explore effective detection strategies that can be utilized by both adolescents and parents, providing practical guidance to mitigate the negative impact of cyberbullying on the well-being of adolescents.





By addressing these crucial aspects, this research endeavours to contribute to the existing body of knowledge on cyberbullying and ultimately support the development of proactive measures to combat this pervasive issue.

## **1.2 Purpose**

Cyberbullying is a new form of bullying but none the less has a major effect on the victim's mental and physical health on a long-term basis. In addition, the need for educating the youth on how to detect and report such incidents increases in parallel with the development of technology. Studies point that the ages with highest participation rate in cyberbullying either by being the victim or perpetrator is between 12-15 years of age. Technology is a big part of a child's life which can either negatively or positively affect their mental and physical health. Moreover, the development rate of technology is higher than the founded ways to protect adolescents from the dangers of the internet in general.

## **1.3 Methodology**

### **Research Design:**

This study employs a mixed-methods research design, incorporating both qualitative and quantitative approaches. The qualitative aspect involves a comprehensive literature review and analysis of existing research on adolescent cyberbullying symptoms and proper response strategies. The quantitative aspect includes the development and evaluation of an educational game in Unity.

### **Literature Review:**

A thorough literature review will be conducted to gather information on cyberbullying, including its definition, types, signs, and effects on adolescents. Existing interventions and prevention strategies to combat cyberbullying in Europe will be explored. Furthermore, an analysis of existing websites and platforms dedicated to reporting, preventing, and informing about cyberbullying will be conducted.

### **Analysis of Educational Games:**

The focus will be on studying educational games as a potential tool for addressing cyberbullying. The literature review will encompass the definition of educational games and their



utilization in addressing cyberbullying. Existing games for cyberbullying awareness and prevention will be reviewed to identify their features, effectiveness, and potential areas for improvement.

### **Game Development:**

Based on the gathered information and analysis, an original educational game will be developed using the Unity game engine. The game will aim to raise awareness about cyberbullying, simulate real-life scenarios, and provide players with opportunities to practice proper response strategies. The design and mechanics of the game will be tailored to the target audience of adolescents.

### **Conclusion and Recommendations:**

Based on the findings from the literature review, game development, user evaluation, and data analysis, a comprehensive conclusion will be drawn. Recommendations will be provided for further enhancements to the educational game, as well as implications for addressing cyberbullying symptoms and promoting proper responses among adolescents.

By following this methodology, you will be able to conduct a rigorous study that combines literature analysis, game development, user evaluation, and data analysis to explore the topic of adolescent cyberbullying symptoms and proper response strategies. The methodology ensures a comprehensive examination of existing knowledge, the creation of an educational game, and an evaluation of its effectiveness.



## CHAPTER 2

### Cyberbullying

#### 2.1 Definition

A general definition for Cyberbullying is the use of communication technology which translates to cell phones, instant messaging, emails, chat rooms or social networking such as Facebook, Instagram, Twitter, Tik Tok and Snapchat to threaten, harass, intimidate, or ridicule someone. Cyberbullying is often done by children, who have increasingly prompt access to these technologies and usually child-victims are reluctant to admit to being targets of cyberbullying.

Cyberbullying specifically includes sending, posting, or sharing negative, harmful, false, or mean content about someone else. (“cyberbullying - National Center for Missing & Exploited Children”) (“What Is Cyberbullying | StopBullying.gov”) It can include sharing personal or confidential information about someone else causing embarrassment or humiliation. Sometimes cyberbullying crosses, the line into unlawful or criminal behavior.

While all kinds of bullying can be described by intentional, regularly repetitive, hurtful behavior towards another person or group, there are specific characteristics when it occurs online. One of those elements is “**Persistency**,” since technology can be accessible 24/7 meaning cyberbullying can happen any time of the day, not just when adolescents are at school. While bullying at school could result in physical evidence like bruises or damaged property of the student “victim,” cyberbullying happens using technology and by a great distance making it evidently “**harder for adults to detect**.” Another characteristic is that it can be “**Anonymous**” meaning that cyberbullying can happen without the perpetrator being detected and held accountable. Moreover, information can be “**viewed by a much larger audience**” since it can be shared easily and fast making it harder to contain or stop the harmful content. Those kinds of exchanges can be “**easier pernicious**” because of the larger distance it is harder for the perpetrator to realize the serious harm caused by their actions. Finally, any kind of content uploaded on the internet can be shared anywhere and to everyone making it hard to delete it entirely and usually “**permanent**.”



## 2.2 Types

Cyberbullying, a pervasive issue in today's digital age, manifests in various forms depending on the means and content employed by the perpetrators. This section aims to provide a comprehensive understanding of the different types of cyberbullying, shedding light on their characteristics, methods, and potential consequences.

### Exclusion-Ostracism

One prevalent form of cyberbullying is exclusion, also known as ostracism. In this type, individuals are intentionally left out or singled out from social groups and online chats. The group subsequently engages in harassment and leaves malicious comments directed at the excluded person. Often, multiple bullies are involved in group chats, amplifying the harmful effects. Online isolation, like social isolation in real-life situations, adversely impacts the victim's well-being .

### Harassment

Harassment is another form of cyberbullying characterized by a series of abusive messages or persistent efforts to contact an individual, often with malicious or threatening intent. This type of cyberbullying occurs through various digital channels, including social media platforms, texting, calling, or emailing. The victim is subjected to relentless harassment, which can lead to psychological distress and emotional harm .

### Cyberstalking

Cyberstalking shares similarities with harassment but goes further by involving false accusations and threats directed at the victim and their loved ones. This form of cyberbullying not only encompasses online actions but can also escalate into real-world consequences. Both cyberstalking and offline stalking are considered criminal offenses, carrying potential legal ramifications for the perpetrator .

### Outing-Doxing-Trickery



Outing, also known as doxing or trickery, involves the cyberbully openly sharing or revealing personal and sensitive information about the victim without their consent. The purpose behind outing is to expose, humiliate, and harm the victim. Examples include spreading personal documents or photos, sharing private messages (often in the form of screenshots) obtained from private groups or chats. In cases of trickery, the bully befriends the victim to gain their trust and deceive them into sharing personal information, which is later used against them.

### **Frapping**

Frapping occurs when the cyberbully exploits the victim's social networks to post inappropriate content with or in the victim's name. This can involve sharing racist or homophobic slurs or engaging in actions aimed at tarnishing the victim's reputation. By utilizing the victim's own social media accounts, the cyberbully seeks to inflict harm and manipulate their online presence .

### **Trolling**

Trolling, although not exclusively related to cyberbullying, can be utilized as a form of online abuse. The perpetrator engages in posting degrading comments about the victim, seeking negative reactions and attention. It is important to note the distinction between online trolls and cyberbullies. While trolls generally seek attention through negative reactions, cyberbullies specifically target and persistently abuse their victims, mirroring real-world bullying dynamics. Platforms like Facebook, Twitter, and TikTok are common grounds for trolling behaviour.

### **Dissing-Denigration**

Dissing or denigration involves the cyberbully posting cruel rumours or gossip about an individual, aiming to harm their reputation or relationships. While dissing shares some similarities with frapping, the key difference lies in the means of attack. In dissing, public posts and private messaging are employed to defame and damage the victim, whereas frapping utilizes the victim's own social media accounts for such purposes.

### **Flaming**

Flaming predominantly occurs through social media platforms and online games, with the primary intention being to engage the victim in an online fight. The cyberbully employs insults,



profanity, and various forms of verbal attacks to provoke the victim. Although like trolling, flaming typically involves direct, targeted attacks aimed at provoking the victim's emotional response.

### **Fake Profiles-Impersonation**

In this form of cyberbullying, the perpetrator creates online accounts or profiles under the victim's name. These fake profiles are used to upload false content without the victim's consent. The cyberbully may send threatening or bullying messages to distress the victim and deceive their friends and family by impersonating the victim. Such actions can result in damaging the victim's reputation, causing distress, and inciting negative reactions from others .

### **Catfishing**

Catfishing, often considered a subtype of trickery or fake profiles, involves creating a fictional online persona or providing false pictures and information. Predators commonly employ catfishing techniques to lure victims into forming relationships or sharing personal information and content. This deceptive behaviour is a prevalent form of cyberbullying that can have detrimental effects on the emotional well-being and safety of individuals .

By exploring and understanding these various types of cyberbullying, it becomes evident that they pose significant risks to the victims' mental and physical health. The next sections of this thesis will delve into the academic and mental health effects associated with cyberbullying, as well as effective detection strategies for adolescents and parents, with the aim of mitigating the negative impact of cyberbullying on adolescents' well-being.



## 2.3 Signs and Effects of Cyberbullying in Adolescents

Bullying using technology leaves very few traces to the perpetrator, making it extremely hard for adults, especially parents of adolescents, to detect. However, it is crucial to be aware of the signs and effects of cyberbullying to support and protect adolescents. This section will explore the emotional, academic, and social indications of cyberbullying and their potential consequences.

### Emotional Indications of Cyberbullying:

One of the emotional indications of cyberbullying is increased stress. Adolescents who are victims of cyberbullying often experience heightened levels of stress that go beyond what is considered normal for their age and responsibilities. They may have difficulties in managing this stress, leading to behavioural changes and avoidance of certain situations. For example, they may exhibit reluctance to attend school, be around their classmates, or even pretend to be ill, especially when the cyberbully is present. Additionally, the stress they experience can manifest in physical symptoms such as unexplained stomach-aches and headaches.

Another emotional consequence of cyberbullying is depression. Victims of cyberbullying may exhibit persistent feelings of sadness, hopelessness, and a lack of interest in activities they previously enjoyed. They may experience a decline in overall mood and motivation, as well as changes in sleep patterns, appetite, and energy levels. Increased irritability and withdrawal from social interactions are also common signs of depression resulting from cyberbullying.

Mood swings and aggressive behaviour can also be indicative of cyberbullying. Adolescents who are cyberbullied may experience frequent and intense mood swings, ranging from anger and frustration to sadness and irritability. They may display uncharacteristic aggression both online and offline. Additionally, they may struggle with regulating their emotions and maintaining healthy interpersonal relationships.

Cyberbullying can lead to emotional isolation. Victims often avoid social activities and withdraw from friends and family. They may feel a sense of loneliness and isolation, even when surrounded by



others. The fear of judgment or retaliation can make them reluctant to share personal experiences or express their emotions.

Furthermore, cyberbullying has a significant impact on self-esteem. Victims may experience a sharp decline in self-confidence and develop a negative self-perception. They may feel worthless and blame themselves for the bullying they endure. This can result in a loss of interest in personal appearance and activities they once enjoyed.

### **Academic Indications of Cyberbullying:**

In terms of academic indicators, one common sign is avoidance in attending school. Adolescents who are cyberbullied may exhibit an unwillingness to go to school due to fear of encountering the cyberbully or their allies. This can lead to increased absenteeism and resistance to participate in academic activities.

Skipping class is another academic indication of cyberbullying. Victims may regularly miss classes without a valid reason or explanation. They may also show a decline in punctuality and engagement in academic responsibilities.

A decrease in work ethic is often observed in adolescents who are cyberbullied. They may experience a loss of motivation and a decline in the quality of their schoolwork. This can manifest as incomplete assignments, missed deadlines, and reduced effort in academic tasks. They may also struggle with concentrating and retaining information.

Losing interest in school is another consequence of cyberbullying. Victims may suddenly lose enthusiasm for academic pursuits and extracurricular activities. They may lack the drive to learn and participate in classroom discussions. As a result, their aspirations for future educational and career goals may diminish.

Dropping grades is a common academic effect of cyberbullying. Victims may experience a noticeable decline in their academic performance, consistently receiving poor grades. They may have





difficulty concentrating and comprehending subject matter, leading to an inability to keep up with coursework. This decline in academic performance can also contribute to a loss of interest in learning.

### **Social Indications of Cyberbullying:**

In terms of social indicators, one common sign is the avoidance of social activities. Victims of cyberbullying may withdraw from social events and extracurricular activities. They may also distance themselves from friendships and show reluctance to form new relationships. This is often due to feelings of exclusion and fear of judgment from their peers.

Another social consequence of cyberbullying is self-harm. Some victims may engage in self-destructive behaviours, such as cutting or burning themselves. They may have unexplained injuries or scars that they try to conceal. Expressions of hopelessness and suicidal thoughts may also be present in severe cases of cyberbullying.

It is important to recognize and address these signs and effects of cyberbullying to provide appropriate support and intervention for adolescents who are being victimized.

## **2.4 Existing Interventions and Prevention Strategies to Combat Cyberbullying in Europe**

In the digital age, cyberbullying has become a prevalent issue impacting adolescents across Europe. To address this growing concern, various intervention programs and prevention strategies have been implemented in schools, communities, and online platforms. This text aims to review the existing interventions and prevention strategies in the European context, assess their effectiveness, identify any gaps, and propose innovative approaches for enhanced prevention and intervention.

### **Current Intervention Programs in Europe:**



Numerous intervention programs have been developed in European schools to address cyberbullying. These programs often include educational workshops, awareness campaigns, and the establishment of reporting mechanisms. The aim is to foster a safe and supportive school environment, empower students to respond to and report incidents of cyberbullying, and promote digital citizenship. Additionally, counseling services may be offered to support both victims and perpetrators.

However, the effectiveness of school-based programs in Europe varies across countries and regions. While some programs have demonstrated positive outcomes in terms of increased awareness and reporting, others have shown only marginal effects. It is crucial to conduct more rigorous evaluations specific to the European context to determine the most effective components and approaches within these programs.

### **Community-Based Initiatives in Europe:**

Communities play a vital role in addressing cyberbullying in Europe. Collaborative efforts between schools, parents, law enforcement agencies, and community organizations are essential for comprehensive prevention and intervention. Community-based initiatives in Europe focus on creating awareness, providing resources, and establishing support networks for individuals affected by cyberbullying.

Community programs often involve workshops, panel discussions, and community forums to engage stakeholders and promote dialogue. These initiatives aim to enhance understanding of cyberbullying and its impact, encourage responsible digital citizenship, and facilitate open communication among parents, educators, and students. Evaluating the impact of community-based interventions specific to the European context is essential to ensure their effectiveness and identify areas for improvement.

### **Online Platforms and Technology Solutions in Europe:**

Given that cyberbullying primarily occurs in online spaces, interventions implemented through digital platforms and technology solutions hold significant potential in Europe. Online platforms have incorporated reporting mechanisms, content moderation policies, and automated detection systems to identify and address instances of cyberbullying. Social media platforms, messaging apps, and



gaming platforms have implemented features to report and block abusive users, promoting a safer online environment.

While these efforts have made progress in mitigating cyberbullying incidents in Europe, challenges remain. European online platforms must continually update their policies and algorithms to adapt to evolving forms of cyberbullying specific to the region. Collaborations between technology companies, researchers, and policymakers in Europe are necessary to ensure the effectiveness of these interventions.

### **Assessing Effectiveness and Identifying Gaps in Europe:**

To assess the effectiveness of existing interventions in Europe, comprehensive evaluation studies specific to the region are crucial. Evaluations should focus not only on short-term outcomes but also on long-term effects, such as changes in attitudes and behaviors related to cyberbullying. Additionally, considering the diverse demographics and cultural backgrounds within Europe is essential to identify any variations in the effectiveness of interventions across different countries and regions.

Despite the efforts made, several gaps exist in current interventions and prevention strategies in Europe. Limited coordination between schools, communities, and online platforms hinders a comprehensive and holistic approach. Moreover, the need for tailored interventions for specific populations within Europe, such as LGBTQ+ youth or those with disabilities, should be acknowledged. Additionally, addressing the role of bystanders and peer influence in intervention programs requires further attention within the European context.

### **Proposing Innovative Approaches in Europe:**

To bridge the gaps in existing interventions in Europe, innovative approaches can be explored. Some potential strategies include:

- a. **Gamified Education:** Developing interactive games or digital platforms more specific to the European region that simulate cyberbullying scenarios and empower users to make informed decisions. These platforms can educate European adolescents about the consequences of cyberbullying, promote empathy, and teach effective strategies for intervention.



b. Digital Literacy Programs: Integrating comprehensive digital literacy programs within European school curricula to educate students about responsible online behavior, critical thinking, and media literacy. These programs can empower European adolescents with the necessary skills to navigate the digital landscape safely and ethically.

## **2.5 Existing Websites and Platforms dedicated to report, prevent and inform about Cyberbullying**

### **1. Safeline**

**(<https://www.safeline.gr/>):**

The Safeline website serves as a crucial resource for Greek children experiencing cyberbullying. In this section, we explore how kids can leverage this platform to report incidents and seek support. By accessing the website, children can locate contact information, such as a helpline or a dedicated reporting channel. Through these channels, they can confidentially report cyberbullying incidents, provide essential details, and access assistance from professionals who specialize in addressing domestic violence and abuse, including cyberbullying.

### **2. End Cyberbullying**

**(<https://endcyberbullying.org/about-us/>):**

End Cyberbullying is an organization committed to combating cyberbullying, and its website offers valuable tools for reporting such incidents. In this section, we delve into the ways children can utilize this platform to report cyberbullying. Kids navigating the website can locate sections like "Report Cyberbullying" or "Get Help," where they will find comprehensive guidance on reporting procedures, accessing relevant resources, and reaching out to the organization for assistance and support.

### **3. Anti-Bullying Alliance**

**(<https://anti-bullyingalliance.org.uk/tools-information/all-about-bullying/online-bullying/what-online-bullying>):**

The Anti-Bullying Alliance website provides an array of resources and information on various aspects of bullying, including online bullying. Within this section, we focus on how children in the United Kingdom can use this platform to report cyberbullying incidents. By exploring the dedicated webpage



on online bullying, children can familiarize themselves with reporting procedures to relevant authorities, such as schools or online platforms. They can also gain insights into effective strategies for staying safe online and mitigating the impact of cyberbullying.

#### **4. School Website**

(<https://ny01913679.schoolwires.net/domain/148>):

School websites can serve as vital reporting tools for cyberbullying incidents within educational institutions. In this section, we explore how children can navigate their school's website to report cyberbullying. By locating sections like "Report Bullying" or "Student Support," children can access contact information for school counselors, teachers, or administrators. These professionals can address reported cases of cyberbullying, initiate investigations, and implement appropriate measures to ensure the safety and well-being of students.

#### **5. Help-line**

(<https://www.help-line.gr/>):

Help-line is an organization in Greece that provides emotional support and counseling services. This section focuses on how children can effectively use this platform to report cyberbullying incidents and seek assistance. By visiting the Help-line website, children can find contact details, including helpline numbers or online chat options. Through these channels, they can confidentially report cyberbullying incidents, discuss their experiences, and receive professional guidance on addressing the issue.

#### **6. Safer Internet Day**

(<https://www.saferinternetday.org/in-your-country/greece>):

Safer Internet Day is an international event aimed at promoting online safety, particularly among young people. In this section, we delve into how children can harness the resources offered by Safer Internet Day to report cyberbullying incidents. By exploring the website, children can access information on reporting mechanisms and support services available in Greece. They may discover links to relevant organizations, hotlines, or online reporting tools that can empower them to effectively report cyberbullying incidents and contribute to a safer online environment.



## 7. "Hamogelo tou Paidiou"

(<https://www.hamogelo.gr/gr/el/ta-nea-mas/ldquopes-mou-oti-sou-kanoun-bullyinghelliprdquo/>):

The website associated with "Hamogelo tou Paidiou" focuses on children's rights, including the issue of bullying. In this section, we discuss how children can stay informed about cyberbullying incidents through news updates provided on the website. Although specific reporting mechanisms might not be available directly on the site, children can seek general advice and contact the organization for guidance on reporting cyberbullying incidents in Greece.

In conclusion, those online resources can be utilized by adolescents to report cyberbullying incidents. By leveraging dedicated websites, school platforms, helpline services, and informative initiatives, children can take initiative-taking steps towards addressing cyberbullying, seeking support, and contributing to a safer online environment.



## **CHAPTER 3**

### ***EDUCATIONAL GAMES AND UNITY***

#### **3.1 Definition of Educational Games**

An educational game refers to a specific category of games that are designed with the primary purpose of imparting knowledge, teaching skills, or reinforcing educational concepts. It combines elements of entertainment and gameplay mechanics with educational content to create an engaging and interactive learning experience. The main goal of educational games is to make the learning process more enjoyable, motivating, and effective by leveraging the inherent engagement and immersive nature of games.

In an educational game, the gameplay mechanics and challenges are carefully crafted to align with the learning objectives and educational content. These games can cover a wide range of subjects and topics, including mathematics, language arts, science, history, and more. They can be designed for various age groups, from young children in preschool to older students in high school or even for adults seeking to enhance their knowledge or skills in a specific area.

One of the key aspects of educational games is the integration of learning into the gameplay itself. This means that players actively participate in activities or solve problems that require them to apply and acquire knowledge or skills. The educational content is seamlessly woven into the game mechanics, making it an integral part of the gameplay experience. By doing so, educational games promote active learning, critical thinking, problem-solving, and decision-making skills.

Educational games often incorporate features like challenges, puzzles, quizzes, simulations, storytelling, and rewards to engage and motivate players. They provide immediate feedback to players, allowing them to assess their progress and adjust accordingly. This feedback mechanism helps learners to understand their strengths and weaknesses, identify areas for improvement, and encourages them to persist and achieve knowledge.

Furthermore, educational games can be designed for different platforms and technologies, including computer-based games, mobile apps, virtual reality, augmented reality, or even physical



board games. The choice of platform depends on a range of factors such as accessibility, interactivity, and the specific learning objectives of the game.

The effectiveness of educational games in facilitating learning has been widely recognized. Research has shown that well-designed educational games can enhance motivation, engagement, retention, and transfer of knowledge and skills. By creating an enjoyable and immersive learning environment, educational games can increase learner involvement, foster active participation, and create a cheerful outlook towards learning.

In conclusion, educational games are a powerful tool for integrating learning and play. They offer a unique and effective approach to education by leveraging the engaging nature of games to enhance the learning process. By combining entertainment and educational content, these games provide an interactive and enjoyable way for learners to acquire knowledge, develop skills, and deepen their understanding of various subjects. As technology continues to advance, the potential for educational games to revolutionize learning and make it more accessible and engaging is boundless.\

### **3.2 Utilizing Educational Games to Address Cyberbullying**

In today's digital age, cyberbullying has become a prevalent issue, affecting individuals of all ages. ("Cyberbullying Prevention Strategies [1 min read] - fairgaze") It is crucial to address this problem and equip students with the necessary knowledge and skills to navigate the online world safely and respectfully. Educational games present a unique opportunity to engage students in learning about cyberbullying while fostering empathy, critical thinking, and responsible digital citizenship. This article explores the benefits of using educational games as a tool to address cyberbullying, highlighting their potential to promote awareness, empower students, and create a positive online culture.

#### **Promoting Awareness:**

Educational games can raise awareness about the various forms of cyberbullying, such as harassment, spreading rumors, and online exclusion. Through interactive gameplay and storytelling, these games can depict realistic scenarios that allow players to witness the consequences and emotional impact of cyberbullying firsthand. By experiencing these situations in a safe and controlled environment, students develop a deeper understanding of the harmful effects of cyberbullying on victims' mental health and well-being.





### **Building Empathy:**

Empathy is a crucial trait in combating cyberbullying. Educational games can help foster empathy by putting players in the shoes of both the victim and the bystander. Through interactive narratives, players can explore different perspectives and make choices that influence the outcome of the game. By immersing themselves in these virtual experiences, students can develop a greater sense of empathy and understanding towards the emotions and experiences of those affected by cyberbullying.

### **Developing Critical Thinking and Decision-Making Skills:**

Educational games provide a platform for students to develop critical thinking and decision-making skills when faced with cyberbullying situations. These games can present players with complex scenarios and ethical dilemmas, requiring them to analyze the situation, consider the consequences of their actions, and make informed decisions. By engaging in problem-solving within the game's context, students can enhance their ability to think critically and make responsible choices when encountering cyberbullying situations in real life.

### **Encouraging Responsible Digital Citizenship:**

Educational games offer an opportunity to promote responsible digital citizenship, emphasizing the importance of respectful online behavior and positive engagement. Through gameplay, students can learn about online etiquette, the significance of consent, the responsible use of social media, and the impact of their digital footprint. By integrating educational content with game mechanics, students can develop a sense of accountability for their online actions and understand their role in creating a safe and inclusive digital environment.

### **Providing Practical Skills and Strategies:**

Educational games can equip students with practical skills and strategies to deal with cyberbullying effectively. Games can introduce students to techniques such as reporting, blocking, and seeking help from trusted adults or authorities. By simulating real-life scenarios, these games allow students to practice assertive communication, conflict resolution, and digital resilience. By actively engaging with these strategies in a game environment, students can build confidence in their ability to respond to cyberbullying incidents.



### **Creating Collaborative Learning Opportunities:**

Educational games can foster collaboration and discussion among students, creating an environment for shared learning and problem-solving. Multiplayer or cooperative game modes allow students to work together to address cyberbullying issues, exchange ideas, and develop empathy-driven solutions. By encouraging dialogue and reflection, these games promote a collective understanding of the impact of cyberbullying and the importance of supporting one another in the online space.

In conclusion educational games present a valuable tool in addressing the issue of cyberbullying by promoting awareness, empathy, critical thinking, responsible digital citizenship, and practical skills. By harnessing the power of interactive gameplay, these games engage students in meaningful learning experiences, enabling them to navigate the online world with empathy, respect, and resilience. However, it is essential to complement the use of educational games with comprehensive educational programs, open communication channels, and ongoing support to ensure a comprehensive approach to cyberbullying prevention and intervention. By leveraging educational games alongside other strategies, educators can play a pivotal role in creating a positive and inclusive digital culture, empowering students to stand against cyberbullying and foster a safer online environment for all.



### 3.3 Existing Games for Cyber-bullying awareness and prevention

#### 1 Simulation Game Mii School



The game "**Mii School**" incorporates 3D technologies to detect drug abuses and also explores the topic of bullying. The game consists of multiple scenes, each focusing on different aspects of bullying and drug addiction. In the bullying scenes, the student can experience being both the victim and the bully, allowing for a comprehensive understanding of bullying from various perspectives. The student is presented with different choices in each scene, such as feeling indifferent, protesting, responding ironically, running away, facing the bullies, or feeling ashamed. The game also examines the student's relationship with their parents in scenes where the student arrives home late or faces academic problems, evaluating the parents' behaviour and involvement. In the drug addiction scenes, the student encounters increasingly dangerous drugs, starting from tobacco and alcohol and progressing to marijuana, cocaine, and ecstasy. Similar to the bullying scenes, the student is presented with choices such as using the drug, refusing, advising friends, occasional use, or leaving the situation. The game also assesses other aspects of the student's life, including personality-related problems, mood, attention in class, beliefs, and integration in social groups. The provided table outlines key metrics for each of the simulated scenes, such as duration, number of people, cameras, and options. The game aims to provide an immersive and interactive experience that educates players about the consequences of bullying and drug addiction while allowing them to make choices and explore different outcomes.







## 2 Simulation Game Step In, Speak Up


PK-12

### Step In, Speak Up!

*Step In, Speak Up!* is an interactive role-play simulation for educators that builds understanding and appreciation for the challenges faced by LGBTQ youth, and prepares users to lead real-life conversations with students to curtail harassment and support those who may be struggling as a result of bullying or isolation.

[Self-Guided Demo](#) [Contact Us](#)

 <b>Market:</b> PK-12 and Government/Non- Profit	 <b>Audience:</b> Educator	 <b>Topic:</b> LGBTQ+ and Violence/Bullying Prevention	 <b>Duration:</b> 30 Minutes
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"**Step In, Speak Up!**" is an interactive role-play simulation specifically designed for educators. Its primary objective is to foster understanding and empathy towards the challenges encountered by LGBTQ youth. The game equips educators with the necessary skills and knowledge to engage in meaningful conversations with students, addressing issues related to bullying, harassment, and isolation that LGBTQ youth often face. By immersing educators in realistic scenarios, the game prepares them to respond effectively and supportively in real-life situations. The Centre for Disease Control and Prevention reports that a significant percentage of high school students identify as LGBTQ or unsure, and they experience higher rates of bullying, hopelessness, suicidal thoughts, and school absenteeism due to feeling unsafe. "Step In, Speak Up!" has been widely adopted by state agencies, schools, and school districts nationwide. It is a research-proven online solution that brings about sustainable behavioural changes, promoting student connectedness, school climate, and safety. The game offers users' access to a range of customized resources, including national, local, and school-specific materials, complementing the simulation content to further enhance educators' knowledge and support capabilities.







### 3 Simulation Game At-Risk for Educators


PK-12

## At-Risk for Middle School Educators

*At-Risk for Middle School Educators* is an interactive role-play simulation for middle school educators that builds awareness, knowledge, and skills about mental health and suicide prevention, and prepares users to lead real-life conversations with students that build resilience, strengthen relationships, and connect them with support.

[Self-Guided Demo](#) [Contact Us](#)

 <b>Market:</b> PK-12 and Government/Non- Profit	 <b>Audience:</b> Educator	 <b>Topic:</b> Mental Health & Well-being, Suicide Prevention, and Violence/Bullying Prevention	 <b>Duration:</b> 60 Minutes
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**"At-Risk for Middle School Educators"** is an online, CE-certified solution that aims to empower educators to intervene early and prevent mental health issues among students. The Centers for Disease Control reports that a significant percentage of children in the United States experience mental disorders, and suicide is a leading cause of death among young adolescents. With over 6,000 schools and districts adopting this research-proven program, it effectively brings about sustainable changes in behaviours that support student wellness, academic performance, attendance, and school safety. The solution provides educators with access to customized national, local, and school-specific resources, along with simulation content. The learning objectives of the program include increasing knowledge and awareness about pre-adolescent mental health, suicide, bullying, and cyberbullying. Educators also learn how to lead conversations with students in distress, identify warning signs, build resilience, and foster connectedness. Additionally, they gain the skills to assess the need for referral, motivate students to seek help, and facilitate a warm hand-off to appropriate support services within their schools. By enhancing educators' understanding and capabilities, the program contributes to improving student wellness and creating a safer school environment.\





“#StopBully” is a project aims to develop a Serious Game with the primary objective of promoting empathy and preventing bullying. It targets both the victims and observers of bullying incidents, aiming to facilitate a change in attitude when confronted with such situations. The significance of this project stems from the widespread prevalence of bullying and the limited effectiveness of existing prevention interventions. In addition to the game itself, the project includes the development of a BackOffice Application to assist psychologists in supporting victims of bullying and conducting research in this field.

The game is designed to be accessible on various platforms such as smartphones, tablets, and PCs, offering flexibility in scenario selection and the role played by the user. The player's decisions within the game have direct consequences in subsequent levels, ensuring a dynamic and interactive experience. The game can be used both within the therapist's office and independently outside of it. Each game session generates a dataset that can be analysed by the therapist or researcher for further evaluation.

An initial prototype has been created, showcasing a platform-style game with cartoon characters, 2D graphics, and simulated scene depth to enhance the sense of immersion. The prototype serves as a testing ground for the chosen tools and expedites the game design process.



**Cybereduca!**  
CyBEREDUCA COOPERATIVO 2.0

Juego para la prevención del bullying y el cyberbullying.

DESCÁRGALO GRATIS!  
FREE download!  
DOAN JAITSI!

**Download**

MAITE GARAIGORDOBIL LANDAZABAL  
Y VANESA MARTINEZ VALDERREY

## 5 Videogame (prevention) Cybereduca

"**Cooperative Cybereduca 2.0**": A Videogame to Prevent and Reduce Bullying and Cyberbullying" is a free online game designed to complement and enhance the effects of Cyberprogram 2.0. The game can be accessed on the website <http://www.cybereduca.com> and is intended to be played on computers with the guidance of an adult who promotes reflection. However, it can also be played independently by adolescents or individually. The game is multilingual, offering options in Spanish, Basque, and English, and can be implemented in various settings such as schools, leisure groups, or family contexts.

The game follows a Trivial Pursuit format, focusing on questions and answers related to the topics of bullying, cyberbullying, and their consequences both in face-to-face interactions and through the use of technology. The game is organized around a fantasy storyline presented in comic format, promoting cooperative, constructive, and non-sexist gameplay. Players take on the roles of different guilds representing the various roles involved in bullying situations: aggressors, victims, defending observers, observers who support aggressors, and passive observers.



The guilds must perform challenging actions and work together to answer questions, rebuild worlds, and achieve their goals. The game consists of 120 questions divided into five topics: cyberphenomena, computer technology and security, cybersexuality, consequences of bullying/cyberbullying, and coping with bullying/cyberbullying. (“Technological Resources to Prevent Cyberbullying During Adolescence ...”) The game promotes communication, prosocial behaviour, and group cohesion while fostering empathy and understanding of the consequences of bullying.

Additionally, the game includes complementary cards that involve dramatic representations of emotions and cooperative actions. The ultimate objective is for all players to successfully answer questions, perform constructive actions, and rebuild worlds, creating a positive social climate and restoring harmony and camaraderie in the city of Zanthia.

Overall, Cooperative Cybereduca 2.0 aims to provide an engaging and educational experience that raises awareness about bullying and cyberbullying while promoting cooperation, empathy, and positive social behaviours.





### 3.4 Unity

Unity has emerged as a leading game development platform, offering powerful tools and features that enable developers to create immersive and interactive experiences across various platforms. This essay explores the history and introduction of Unity as a game platform and delves into its application in the realm of Serious Games. Unity's versatility and accessibility have revolutionized game development, allowing for the creation of educational, training, and simulation experiences that extend beyond entertainment. Serious Games, which combine entertainment with educational or informative purposes, have seen significant growth in recent years, and Unity provides a robust framework for their development. This essay will discuss Unity's journey as a game platform, highlight its core features, and examine the utilization of Unity in Serious Games, showcasing its potential to impact various domains, including education, healthcare, and corporate training.

Unity Technologies, the company behind the Unity platform, was founded in 2004 by David Helgason, Joachim Ante, and Nicholas Francis. ("Unity: Business Model, SWOT Analysis & Competitors 2023 - GITNEX") Initially, Unity focused on developing a Mac-only game development tool. However, recognizing the need for a cross-platform solution, Unity expanded its scope and released Unity 1.0 for Windows in 2005. This cross-platform capability became a defining feature of Unity, enabling developers to create games for multiple platforms, including desktop, mobile, console, and virtual reality (VR).

Over the years, Unity continued to evolve, introducing new features, improving performance, and expanding its user base. Unity gained popularity due to its intuitive interface, extensive asset store, and strong community support. It became the go-to engine for independent developers, small studios, and even large game development companies.

Unity is a powerful game engine that offers developers a comprehensive suite of tools and features for game development. It provides a visual editor, a scripting system, and a range of functionalities that facilitate the creation of interactive and visually appealing games. Key elements of Unity include:



a) **Unity Editor:** The Unity Editor is a visual interface where developers can design, build, and evaluate their games. It offers a wide range of tools for creating scenes, managing assets, and implementing game logic.

b) **Scripting:** Unity supports scripting in several languages, including C#, JavaScript, and Boo. Developers can use these scripting languages to define game behaviour, create interactions, and implement game mechanics.

c) **Asset Store:** Unity's Asset Store provides a vast library of ready-to-use assets, including 3D models, sound effects, animations, and scripts. This marketplace enables developers to enhance their games by integrating high-quality assets into their projects.

d) **Cross-Platform Deployment:** Unity allows developers to deploy games across multiple platforms with ease. It supports platforms such as Windows, macOS, iOS, Android, Xbox, PlayStation, and more. This cross-platform compatibility enhances the reach and accessibility of games developed using Unity.

### 3.5 Unity and Educational Games

Serious Games, a category of games beyond pure entertainment, aim to educate, inform, train, or raise awareness about various subjects. These games leverage the power of gameplay and interactivity to engage users in meaningful experiences. Serious Games span diverse domains such as education, healthcare, corporate training, and social impact, and they have gained recognition for their ability to combine learning objectives with engaging gameplay.

#### The Impact of Unity in Education

a) **Gamified Learning Experiences:** Unity enables the development of educational Serious Games that transform traditional learning into engaging and interactive experiences. Students can explore virtual environments, solve puzzles, and interact with virtual characters, fostering active learning and improving knowledge retention.

b) **Simulation and Training:** Unity facilitates the creation of realistic simulations and training modules that allow learners to practice skills in a safe and controlled environment. For instance,

[42]

Cyberbullying Symptoms and proper Response through an Educational Game in Unity.



medical students can experience virtual surgeries or emergency scenarios, while pilots can simulate flight operations. These immersive training experiences enhance skill development and prepare individuals for real-world challenges.

c) **Accessibility and Personalization:** Unity-based educational Serious Games can be tailored to individual learning styles and needs. Through adaptive learning algorithms, personalized content delivery, and progress tracking, Unity empowers educators to provide customized learning experiences that cater to each student's strengths and weaknesses.

### **Unity in Healthcare and Therapeutic Applications**

a) **Physical Rehabilitation:** Unity-powered Serious Games have proven effective in physical therapy and rehabilitation, providing engaging exercises and virtual environments that motivate patients during their recovery journey. These games promote movement, coordination, and motor skills development, enhancing the rehabilitation process.

b) **Mental Health Interventions:** Unity-based Serious Games have been used in the field of mental health to address issues such as anxiety disorders, phobias, and post-traumatic stress disorder (PTSD). These games offer exposure therapy, relaxation techniques, and cognitive behavioural interventions within immersive virtual environments, assisting individuals in managing and overcoming mental health challenges.

### **Unity for Corporate Training and Professional Development**

a) **Simulated Work Environments:** Unity allows the creation of virtual work environments that mirror real-world settings. Through Unity-based Serious Games, employees can undergo immersive training in areas such as customer service, conflict resolution, and team collaboration, preparing them for real-world challenges in a risk-free environment.

b) **Soft Skills Development:** Unity-powered Serious Games provide a platform for employees to develop essential soft skills, such as communication, leadership, and problem-solving. These games offer interactive scenarios, role-playing opportunities, and decision-making challenges, fostering the growth of critical workplace competencies.



c) Safety and Emergency Preparedness: Unity-based Serious Games can simulate emergency situations, enabling employees to practice safety protocols, crisis management, and disaster response. These virtual simulations enhance preparedness, reduce risks, and improve overall safety in various industries.

### **Unity's Role in Social Impact and Awareness**

Unity-powered Serious Games have been instrumental in driving social impact and raising awareness about pressing issues. Games focused on environmental conservation, social justice, poverty alleviation, and public health campaigns engage players while conveying important messages and inspiring action.

Unity has revolutionized the field of Serious Games, empowering developers to create immersive and interactive experiences that transcend entertainment. With its versatile features, cross-platform compatibility, and robust development tools, Unity has facilitated the development of Serious Games in domains such as education, healthcare, corporate training, and social impact. From gamified learning experiences to simulation-based training and therapeutic interventions, Unity has contributed significantly to improving learning outcomes, skill development, and raising awareness about critical issues. As technology continues to advance, Unity's ongoing evolution and commitment to empowering developers will further enhance the potential of Serious Games in revolutionizing education, training, and beyond, creating a positive impact on individuals and society as a whole.

### **Unity's Impact in Educational Games for Cyberbullying**

a) Immersive and Interactive Experiences: Unity enables the creation of immersive and interactive educational games that engage players emotionally and cognitively. Through compelling narratives, realistic scenarios, and decision-making opportunities, players can experience the consequences of cyberbullying firsthand, fostering empathy and understanding.

b) Gamified Learning and Skill Development: Unity-based educational games can provide a gamified learning experience where players acquire knowledge and develop skills to prevent and address cyberbullying. These games can incorporate quizzes, challenges, and interactive elements to enhance learning and retention of information.



c) Personalized Learning and Intervention: Unity's adaptability allows for the development of educational games tailored to individual learners. By offering personalized feedback, tracking progress, and adapting gameplay based on the player's responses, Unity-based games can provide targeted interventions and support for individuals who have experienced or engaged in cyberbullying.

### **The Impact and Potential of Unity-based Educational Games for Cyberbullying**

Unity-based educational games for cyberbullying have the potential to make a significant impact in promoting awareness, empathy, and prevention. By engaging players in interactive and immersive experiences, these games can effectively educate individuals about the consequences of cyberbullying and empower them to take proactive measures. Furthermore, the versatility of Unity enables the development of personalized interventions, allowing for targeted support for victims and individuals displaying cyberbullying behaviours. Such games can foster a positive online culture, encouraging empathy, respect, and responsible digital citizenship.

To sum up Unity, as a game development platform, offers immense potential in the creation of educational games that address the issue of cyberbullying. By combining the interactive and immersive nature of games with educational content, Unity-based games can raise awareness, foster empathy, and equip individuals with the knowledge and skills to prevent and respond to cyberbullying. By harnessing the power of Unity and embracing educational games, we can work towards creating a safer online environment, empowering individuals to combat cyberbullying, and fostering positive digital interactions.



## **CHAPTER 4**

### ***CREATING THE GAME***

#### ***4.1 Concept of the Game***

##### **The Objective**

The objective of this thesis was to develop an online serious game aimed at educating and providing appropriate feedback to its users. The target audience for this game consists of adolescents between the ages of 10 and 14, who may have varying attention spans and levels of patience. To meet this objective, a multiple-choice quiz format was chosen, where players receive feedback based on their choices.

##### **The Mascot**

To create an immersive chat-like environment, the game's character, named "Shiloh," was designed based on the visual characteristics of a robot and artificial intelligence. Since the target audience can be of any gender, a gender-neutral name was chosen for the character. Shiloh, the Artificial Intelligence, interacts with players by providing questions, feedback, and general guidance throughout the game.

##### **Questions, Answers and Feedback**

The game's main purpose was to educate the target audience about the ten types of cyberbullying: exclusion-ostracism, harassment, cyberstalking, outing-doxing-trickery, frapping, trolling, dissing, denigration, flaming, fake profiles-impersonation, and catfishing. The chosen approach involved presenting short scenarios, each representing one type of cyberbullying, and offering potential answers for the players to consider. Depending on the answers chosen, regardless of whether they were correct or incorrect, the game provided feedback. These questions, answers, and feedback are referred to as the main game phase.



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Visual Computing



## Scoring System

Instead of utilizing a traditional scoring system, the game incorporated a unique approach considering its educational nature. The scoring system was based on two dimensions: psychological and physical states, which are affected by bullying experienced by adolescents. The questions in the game impacted these two aspects. The psychological state was divided into three levels, and when it reached the lowest level, the physical state was affected. This design aimed to provide an understanding of how psychological well-being can influence physical well-being.



## 4.2 Visualization of the Game

The Images bellow were created with:

*Procreate(program)*

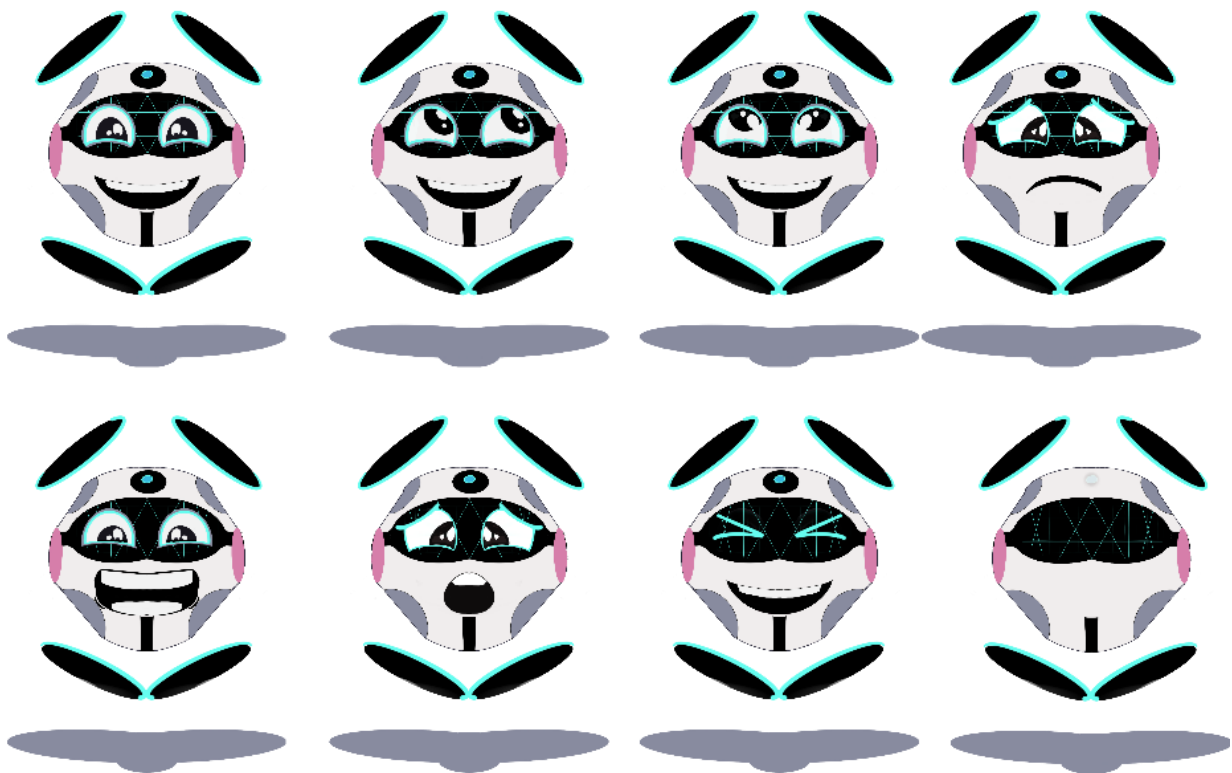
*Apple iPad Pro(Tablet)*

*Apple Pencil*

Shiloh(mascot):

Shiloh, the game's character, was designed with the concept of a robot AI in mind. However, to enhance its personification, multiple expressions were added to its eyes and mouth. This allowed Shiloh to convey a range of emotions and engage with the players on a more relatable level.

6 Shiloh Game Character







## Eyes

The character changes the eyes depending on the answers and phases of the game.

### 7 Eye Expressions





## Mouth Expressions

To enhance the realism of the character, the mouth expressions were designed to change dynamically based on a character recognition algorithm. This algorithm analyses the characters in the sentences and selects the appropriate mouth expression accordingly. To facilitate this feature, an array was created in Unity, linking each letter with its corresponding expression image. This allowed for seamless integration between the character's dialogue and the changing mouth expressions, creating a more immersive and realistic experience for the players.

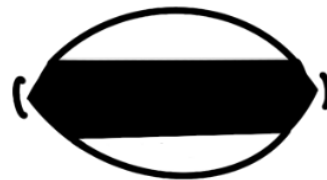
### 8 Mouth Expressions



**Q,W**



**O**



**L**



**A,E,I**



**CH,J,SH**



**F,V**



**B,M,P**



**C,D,G,N,K,  
S,T,X,Y,Z**



**U**



## UI Elements

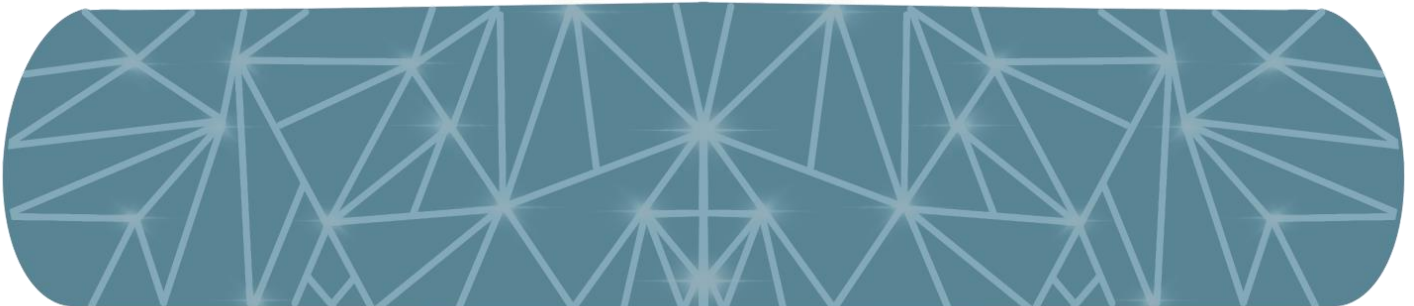
### Text Box

9 Text Box



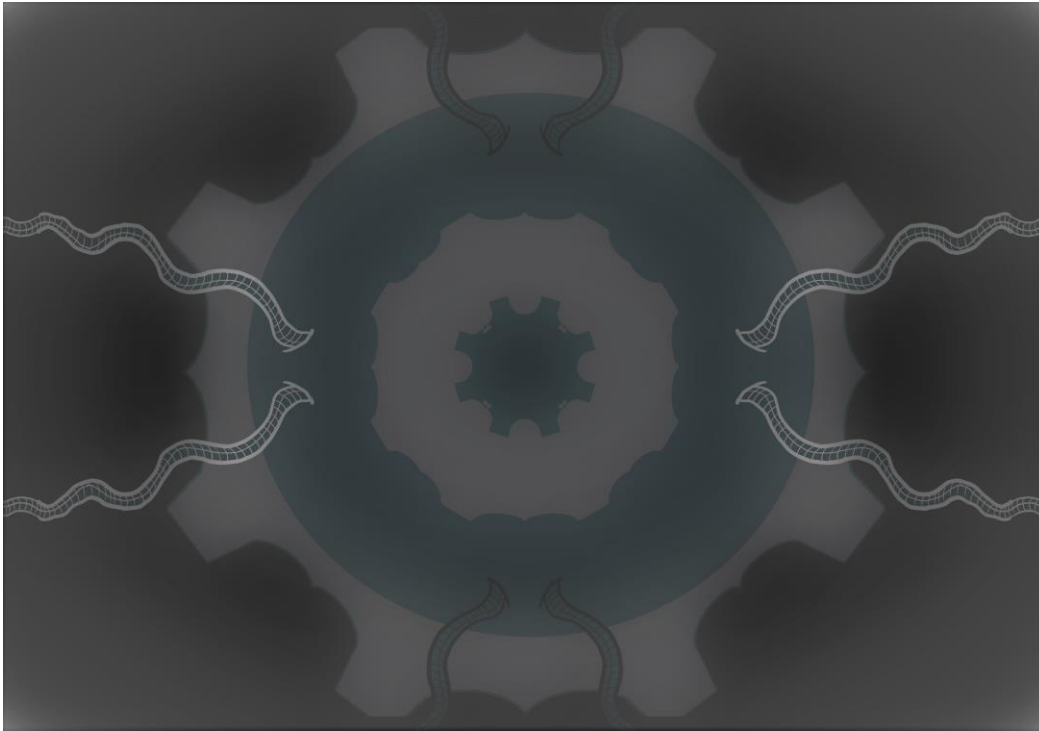
### Answer Box

10 Answer Box





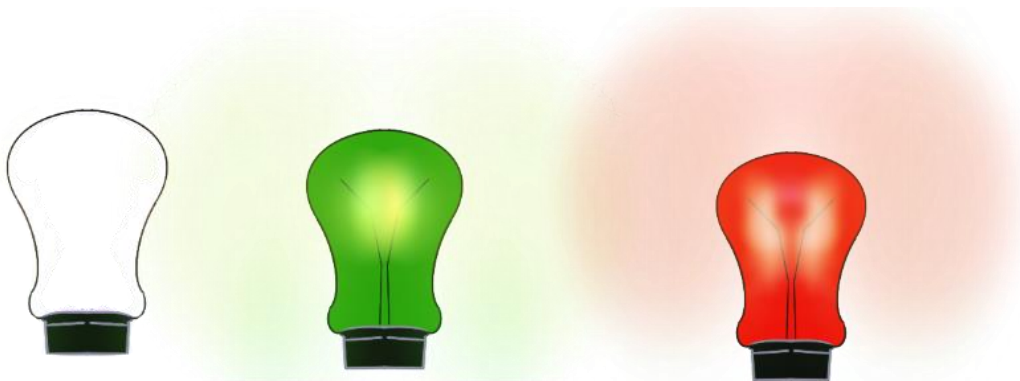
## Background-Image



## Light Bulbs

In addition to enhancing the visualization, specific textures were utilized to indicate whether the player answered correctly or incorrectly. These textures served as a visual cue to provide immediate feedback to the player regarding the accuracy of their response. By incorporating these textures into the game's design, it created a clearer and more intuitive visual representation, allowing players to easily identify the correctness of their answers.

*11 Light Bulbs*





## Psychological Bar

The player's answers primarily affect the psychological state, which is divided into three phases: Happy, Anxious, and Sad. To effectively represent these states, various layers were employed, and they were extracted as GIFs to enhance the user interface (UI). By utilizing different layers and converting them into GIFs, the game was able to visually communicate the player's psychological state, creating a more immersive and engaging experience. These animated GIFs added depth to the UI and provided a dynamic representation of the player's emotional journey throughout the game.

*12 Psychological state Happy, Anxious, Sad*

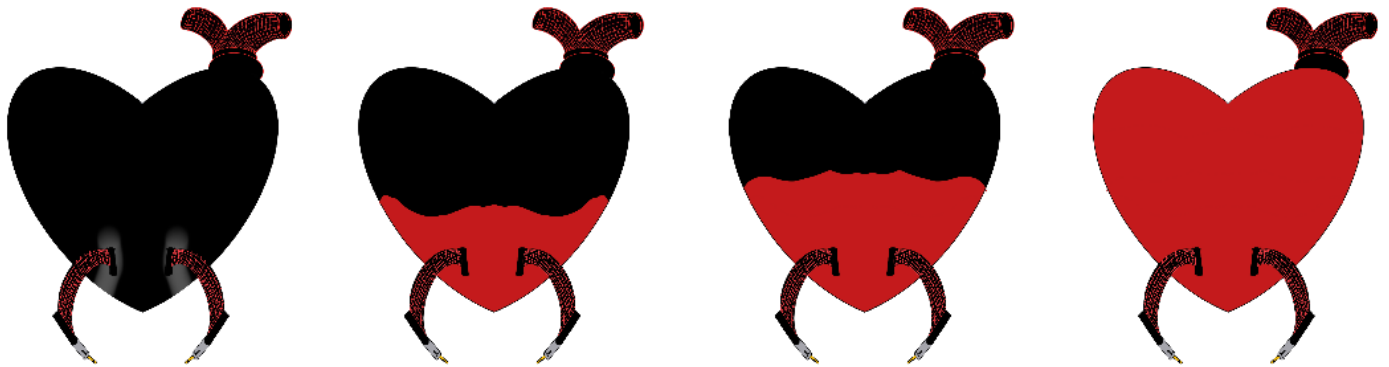




## Physical Bar

The physical state, which is influenced when the player answers incorrectly and the psychological state reaches its lowest point (Sad), is represented by hearts displayed below. These hearts serve as visual indicators of the player's physical well-being within the game. When the player's psychological state is in the Sad phase and incorrect answers are given, the hearts below reflect the impact on their physical state. This visual representation enhances the understanding of the interconnectedness between the player's psychological and physical well-being, providing a clear and immediate feedback mechanism

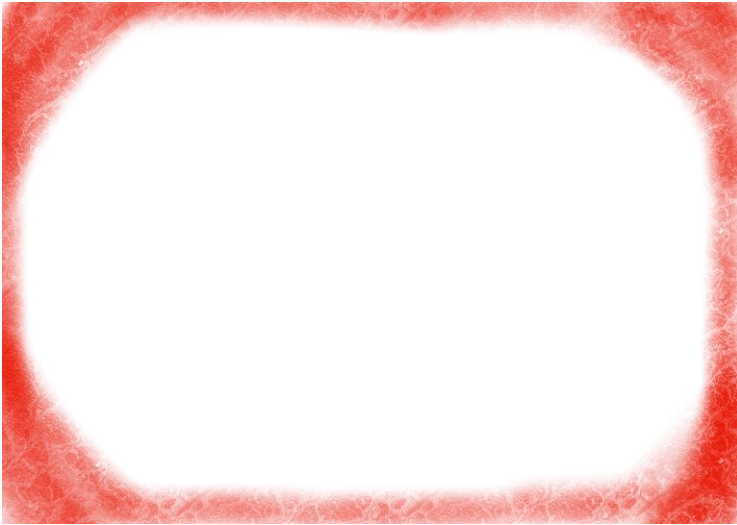
*13 4 States of Physical Bar*





## Damage to Physical Health

To enhance the visual representation and draw attention to the dropping Health Bar, a texture was developed to surround the edges of the screen. This texture serves as a visual indicator, emphasizing the declining health status of the player. By incorporating this visual element, the game effectively communicates the importance of monitoring and maintaining the Health Bar throughout the gameplay experience.

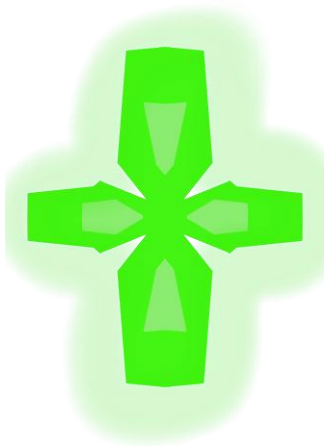




## Earning Point to Physical Health

In a similar fashion to the Damage Indicator, a cross symbol is utilized within the game to signify the restoration of the player's health. Shiloh explains the purpose of this cross symbol, highlighting its significance in the gameplay experience.

When the player earns back health, the cross symbol appears, visually indicating the replenishment of the character's well-being. This visual cue serves as a positive feedback mechanism, reinforcing the player's actions and choices that contribute to the restoration of their character's health.







### **4.3 Text Used in The Storyboard and Game**

#### **Main Menu**

- ◆ Start button.
- ◆ Quit button.
- ◆ Credits button

If the start button is selected a hand appears presses the button (animation) so the game starts. The introduction of the game begins like a chat screen on a smartphone:

#### **Introduction**

Game: Well, hello! I do not have many visitors; it's has been a while since I had a conversation.

Game: Nice to meet you Champion, do you know how this game works?

"Gives the option of yes or no"-Yes, skips tutorial, -No, plays tutorial.

#### **Tutorial**

Game: So, this is like a game of multiple-choice questions, I make a question and you have to select the right answer from your options. BUT, depending on your answer you might have some.....penalties. So, do pay attention. Let's try it:

"What is my name?"

- Alex
- Shiloh
- Sarah

Correct answer:

Game: Cool, you remember! Thank you!

Wrong answer

Game: Hmm, not quiet.... but you were close.

Game: So, let's continue. Do you see this light bulb above it will turn either?

green or red depending on your answer.

Now pay attention those two, they also affected depending on your choice.

The right one is your mental state, only one face will appear on the screen during the game.



Careful though our psychology is important to me and to you. Each face represents a state "happy" is the best one, "confusion" is a mild state and the worst one is "sad". Happy and Sad affect the most important part...

The left one, is our physical state. DO NOT LET YOUR HEART TURN BLACK.....ahem.....I mean if your answers are wrong, and your mental state is "SAD" it will affect your heart and it will start changing color. If it turns completely black the game will end it means KAPOOT.

To be clear Wrong answer means your mental state drops and if it reaches its lowest (Sad) you lose health. You have a total of four tries before the game is over.

If you do answer correctly (You better!) you get mentality if you reach max mentality (Happy), you get health back.

Alright! I think you have a grasp of it.

Are you ready?

### **Main Game Phase (Questions & Feedback)**

Question 1:

Scenario: You receive a mean message on social media from someone you don't know, calling you names and making fun of your appearance. What should you do?

- a) Reply with an equally mean message.
- b) Block and report the person to the social media platform.
- c) Share the message with your friends for support.

(a) Feedback: It is important not to respond with more negativity, even if someone is being mean to you. Instead, focus on protecting yourself. The best course of action is to block and report the person to the social media platform. Remember, responding with kindness or not responding at all is a better way to manage such situations.

(b) Feedback: That's the right choice! Blocking and reporting the person will help protect you from further harm and let the social media platform know about the inappropriate behaviour. Remember, it is important to prioritize your well-being and not engage in negative exchanges.

(c) Feedback: It is understandable that you might seek support from friends, but sharing the mean message can further spread negativity. It is best to prioritize your well-being by blocking and reporting



the person to the social media platform. Remember, it's important to surround yourself with positivity and seek help from trusted adults when facing cyberbullying.

### Question 2:

Scenario: You notice that a friend is constantly being excluded and left out of group chats and online activities. How can you help?

- a) Join the group chats and exclude your friend as well.
- b) Confront the people excluding your friend and demand an explanation.
- c) Reach out to your friend privately, offer support, and include them in your own activities.

(a) Feedback: It's important to stand up against exclusion and support your friend. Instead of joining in the exclusion, try to include your friend in your own activities. Show them kindness and let them know they're valued. Being an inclusive friend is a great way to make a positive impact.

(b) Feedback: Confronting the people excluding your friend might escalate the situation and create more tension. Instead, encourage open communication and kindness. Reach out to your friend privately, offer support, and include them in your own activities. Being a compassionate friend can make a positive difference in their experience.

(c) Feedback: Well, done! Being a supportive friend is important. By reaching out privately and including your friend in your activities, you're showing kindness and inclusiveness. Keep supporting your friend and standing up against exclusion.

### Question 3:

Scenario: You discover that someone has created a fake profile using your name and picture on a social media platform. What is the best action to take?

- a) Ignore it and hope it goes away.
- b) Ask your friends to report the fake profile.
- c) Report the fake profile to the social media platform and provide evidence.

(a) Feedback: Ignoring a fake profile created using your name and picture might not be the best approach. It's important to take action to protect your identity. The right thing to do is to report the fake profile to the social media platform and provide evidence. This way, you can ensure your online safety.



(b) Feedback: While it's good to seek support from friends, relying solely on them to report the fake profile might not be enough. Take a proactive approach by reporting the fake profile to the social media platform yourself and providing evidence. It ensures the platform is aware of the situation and can take appropriate action.

(c) Feedback: Great job! Reporting the fake profile to the social media platform is the right thing to do. Make sure to provide any evidence you have, such as screenshots, to help the platform take appropriate action. Remember, it's important to protect your identity online.

#### **Question 4:**

Scenario: You notice that someone is consistently posting hurtful comments on your friend's online photos and videos. What should you advise your friend to do?

- a) Delete their account and avoid using social media.
- b) Respond with equally hurtful comments to defend themselves.
- c) Block the person and report the abusive comments to the platform.

(a) Feedback: Deleting the account and avoiding social media altogether may not be the best solution. Instead, it's important to address the situation and protect yourself. Advise your friend to block the person and report the abusive comments to the platform. Encourage them to continue using social media in a positive and safe manner.

(b) Feedback: It's understandable that your friend might feel hurt and want to defend themselves, but responding with equally hurtful comments will only perpetuate the cycle of negativity. Encourage your friend to prioritize their well-being by blocking the person and reporting the abusive comments to the platform. It's important to address the issue responsibly and seek support from trusted adults.

(c) Feedback: Excellent choice! Blocking the person will prevent further hurtful comments, and reporting the abusive comments helps maintain a safe and positive online environment. Always remember to prioritize your well-being and take action against online harassment.



### Question 5:

Scenario: You receive a message from someone claiming to have embarrassing information about you and threatening to share it online if you don't do what they say. What is the appropriate response?

- a) Follow their instructions to avoid embarrassment.
- b) Ignore the message and hope they won't carry out the threat.
- c) Take screenshots of the conversation and report it to a trusted adult or authority figure.

(a) Feedback: It's crucial not to comply with the demands of someone threatening to share embarrassing information. Following their instructions could lead to more harm. The appropriate response is to take screenshots of the conversation and report it to a trusted adult or authority figure. They can provide guidance and support.

(b) Feedback: Ignoring the message and hoping the threat won't be carried out might not be the most effective approach. It's important to take the situation seriously and seek support. Advise your friend to take screenshots of the conversation and report it to a trusted adult or authority figure. They can help navigate the situation and ensure their safety.

(c) Feedback: Well, done for making the right decision! By taking screenshots of the conversation and reporting it to a trusted adult or authority figure, you're seeking help and taking the necessary steps to address the situation. Remember, never comply with the demands of someone threatening to harm you online.

### Question 6:

Scenario: While playing an online game, you notice a player repeatedly sending you offensive and hateful messages. How should you handle the situation?

- a) Retaliate with insults and offensive language.
- b) Block and report the player within the game platform.
- c) Share their messages with your online friends to seek revenge.

(a) Feedback: Engaging in a negative exchange by retaliating with insults and offensive language won't resolve the situation positively. Instead, advise your friend to block and report the player within the game platform. It's important to maintain a respectful and enjoyable gaming experience.



(b) Feedback: Great choice! Blocking and reporting the player is the best course of action when facing offensive and hateful messages. It helps maintain a positive gaming experience and ensures your safety. Don't engage in negative exchanges; focus on enjoying the game instead.

(c) Feedback: Seeking revenge or involving others in the conflict will likely escalate the situation and create more negativity. The best approach is to prioritize your well-being by blocking and reporting the player within the game platform. Focus on enjoying the game and maintaining a positive gaming experience.

### **Question 7:**

Scenario: A classmate is being cyberstalked by someone they met online, who is now constantly monitoring their online activity and sending threatening messages. What should your classmate do?

- a) Continue engaging with the stalker to gather more evidence.
- b) Keep the situation a secret and hope it resolves on its own.
- c) Inform a trusted adult about the situation and involve law enforcement if necessary.

(a) Feedback: Engaging further with a cyberstalker can be dangerous and increase the risk. It's crucial to prioritize your safety. Advise your classmate to inform a trusted adult about the situation and involve law enforcement if necessary. They can help take appropriate actions to ensure their well-being.

(b) Feedback: Keeping the situation a secret can prolong the harassment and prevent you from receiving the necessary support. It's important to prioritize your safety. Encourage your classmate to inform a trusted adult about the situation and involve law enforcement if necessary. They can provide guidance and take appropriate actions to ensure their well-being.

(c) Feedback: You're handling the situation wisely! It's crucial to involve a trusted adult when dealing with cyberstalking or threats online. They can help guide you through the necessary steps, including involving law enforcement if the situation escalates. Your safety is a priority.

### **Question 8:**

Scenario: You receive an email asking for your personal information, including your address and social security number, claiming it's necessary for a prize you've won. How should you respond?

- a) Provide the requested information as instructed.
- b) Forward the email to your friends to see if it's legitimate.



c) Delete the email and never share personal information online.

(a) Feedback: It's essential to be cautious about sharing personal information online. Never provide personal information, such as your address and social security number, to unknown sources. The correct response is to delete the email and never share personal information online to protect your privacy and security.

(b) Feedback: Forwarding the email to your friends might not be the best course of action as they may not have the expertise to determine its legitimacy. It's important to prioritize your privacy and security. The correct response is to delete the email and never share personal information online. Remember, personal information should only be shared with trusted sources.

(c) Feedback: Great decision! It's important to be cautious about sharing personal information online, especially with unknown sources. Deleting the email and avoiding sharing personal details is the safest approach. Remember, genuine prize notifications wouldn't ask for sensitive information via email.

### **Question 9:**

Scenario: You discover that someone is spreading false rumors about you and your friends on a social media platform. What is the most effective action to take?

a) Create a new profile and start over to avoid the rumors.

b) Respond with insults and negative comments about the person spreading the rumors.

c) Collect evidence of the false rumors and report the user to the social media platform.

(a) Feedback: Creating a new profile might not address the issue effectively. It's important to address false rumours responsibly. Encourage your friend to collect evidence of the false rumours and report the user to the social media platform. Reporting helps in addressing the issue and maintaining a positive online presence.

(b) Feedback: Responding with insults and negative comments will only escalate the situation and contribute to a hostile online environment. Instead, advise your friend to collect evidence of the false rumours and report the user to the social media platform. Reporting helps address the issue in a responsible manner, and it's important to maintain a positive online presence.



(c) Feedback: You're handling this situation maturely! Collecting evidence of the false rumours, such as screenshots or saved messages, is important for reporting the user to the social media platform. Reporting helps address the issue and ensures a safer online environment.

**Question 10:**

Scenario: You come across a public online discussion where people are intentionally provoking others with offensive and hurtful comments. What should you do?

- a) Join the conversation and defend those being targeted.
- b) Engage in a heated argument to prove your point.
- c) Disengage from the conversation and report the offensive comments to the platform moderators.

(a) Feedback: Engaging in a heated argument might not be the best approach. Instead, advise disengaging from the conversation and reporting the offensive comments to the platform moderators. It's essential to maintain a positive and respectful online environment.

(b) Feedback: Engaging in a heated argument can escalate the situation and perpetuate negativity. It's best to disengage from the conversation and report the offensive comments to the platform moderators. By doing so, you contribute to creating a positive online environment and help ensure that inappropriate behaviour is addressed.

(c) Feedback: Well, done! Disengaging from the conversation and reporting the offensive comments to the platform moderators is the right thing to do. It helps maintain a positive online environment and ensures that the platform takes appropriate action against offensive behaviour.





## 4.4 Storyboard

In the realm of educational game development, the use of storyboarding has emerged as a critical step in the design and implementation process. This chapter explores the significance of storyboarding as a powerful tool in the creation of educational games, with a specific focus on a Unity-based game aimed at promoting awareness about cyberbullying. By delving into the concept of storyboarding and its relevance in game development, this chapter sets the foundation for understanding its role in facilitating effective communication, planning, and integration of educational content.

### Understanding Storyboarding

Storyboarding is a visual storytelling technique widely employed in various creative disciplines, including film, animation, and game development. It involves the arrangement of a series of sketches, illustrations, or frames, accompanied by relevant textual information, to visually depict the sequential progression of events. Within the context of educational game development, storyboarding provides a visual blueprint that outlines the structure, flow, and interaction of the game. By presenting key scenes, actions, and dialogue, the storyboard serves as a visual narrative, guiding the development process.

### The Importance of Storyboarding in Game Development

The creation of a storyboard before the actual development of an educational game holds immense value for several reasons. Firstly, it serves as a roadmap, providing developers with a clear direction and plan for the game's design and implementation. Through storyboarding, various components, levels, and interactions can be carefully organized and conceptualized, ensuring a cohesive and engaging user experience. The storyboard acts as a visual guide that assists in identifying potential design challenges and refining the overall gameplay mechanics.

Furthermore, storyboarding facilitates effective communication and collaboration within the development team. By presenting a visual representation of the game's vision, mood, and gameplay mechanics, the storyboard becomes a shared reference point, ensuring that all team members are aligned in their understanding and efforts. It serves as a common language, enabling efficient communication and reducing potential misunderstandings during the development process.



In the context of an educational game, storyboarding becomes even more critical. It enables developers to meticulously plan and integrate educational content seamlessly into the gameplay experience. By visualizing the storyboard, the pacing, clarity, and effectiveness of the game's storytelling can be evaluated, ensuring that the intended educational objectives are effectively conveyed to the players. This iterative process of refining the storyboard enhances the educational value of the game, as it allows for adjustments and improvements to be made early in the development cycle.

### **Applying Storyboarding in the Cyberbullying Awareness Game**

Within the specific context of the Unity-based educational game on cyberbullying, storyboarding serves as a fundamental step in creating an impactful and engaging experience for the players. The storyboard allows for the visualization of key scenarios, such as identifying cyberbullying situations, understanding their consequences, and promoting strategies for prevention. By structuring the game's narrative and interactions through storyboarding, the development team can ensure that the gameplay mechanics align with the educational objectives and effectively convey the intended message to the players.

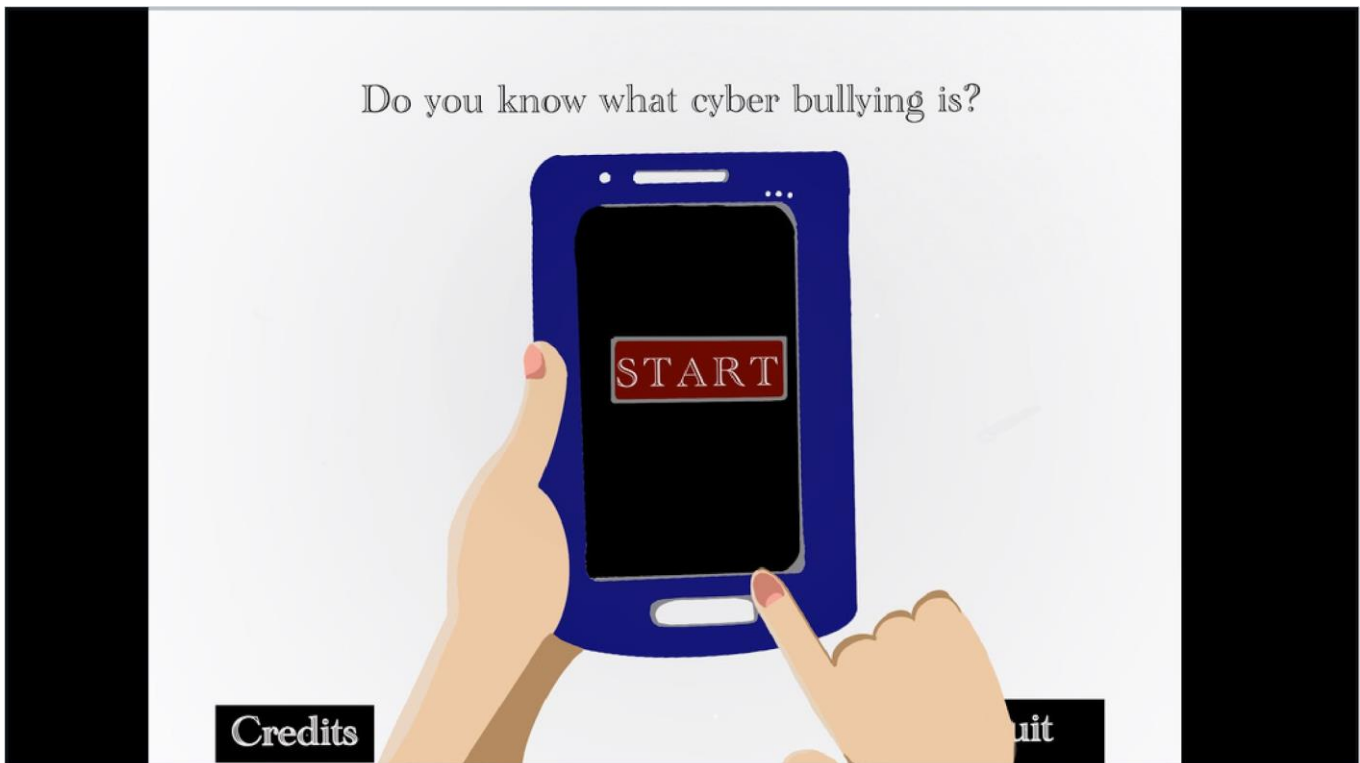
### **Conclusion**

Storyboarding provides a visual roadmap that guides the development process, enhances communication within the team, and facilitates the integration of educational content. By visualizing the narrative, pacing, and mechanics, storyboarding ensures a coherent and engaging gameplay experience that effectively delivers the intended educational objectives. The subsequent chapters will delve into the implementation of the storyboard and the development of the cyberbullying awareness game within the Unity environment, further demonstrating the practical application and benefits of storyboarding in educational game design.



## Main Menu

14 Storyboard Main Menu



Introduction page

Includes three buttons (Start, Quit, Credits)

When the player clicks "Start" the hand will move to the button and the game starts.



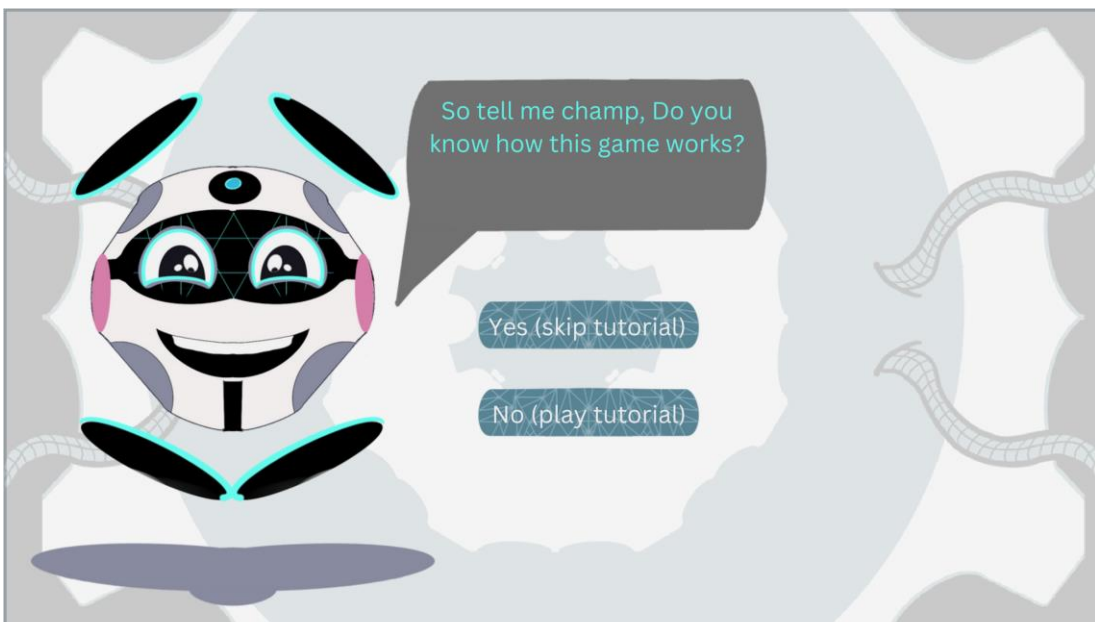
## Introduction

### 15 Storyboard Introduction



The robot Shiloh introduces itself before the game starts.  
For privacy reasons the robot calls the player neutral names

### 16 Storyboard Introduction to either Skip or Play Tutorial

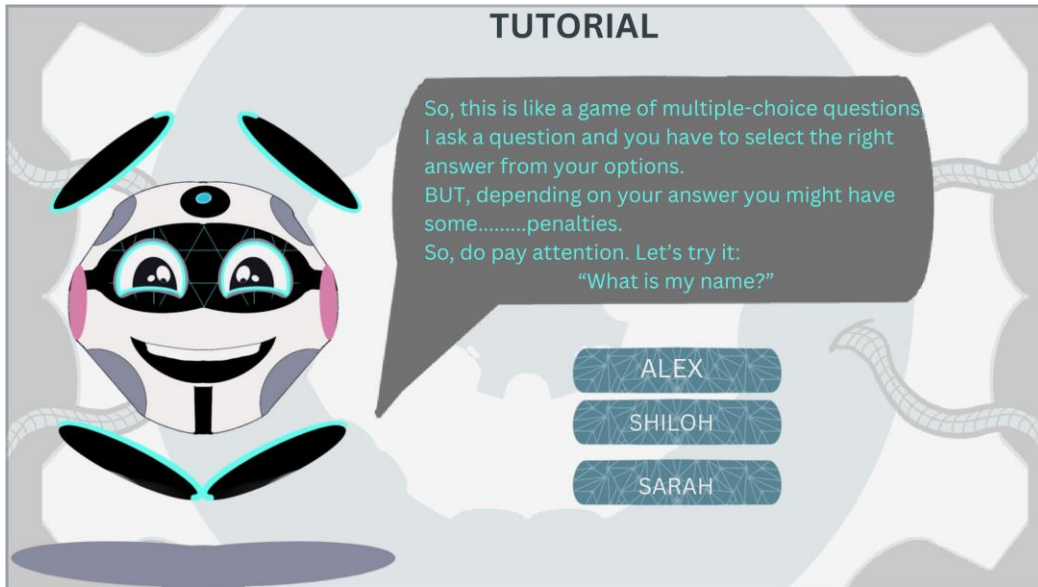


The player choses to play or skip the tutorial.



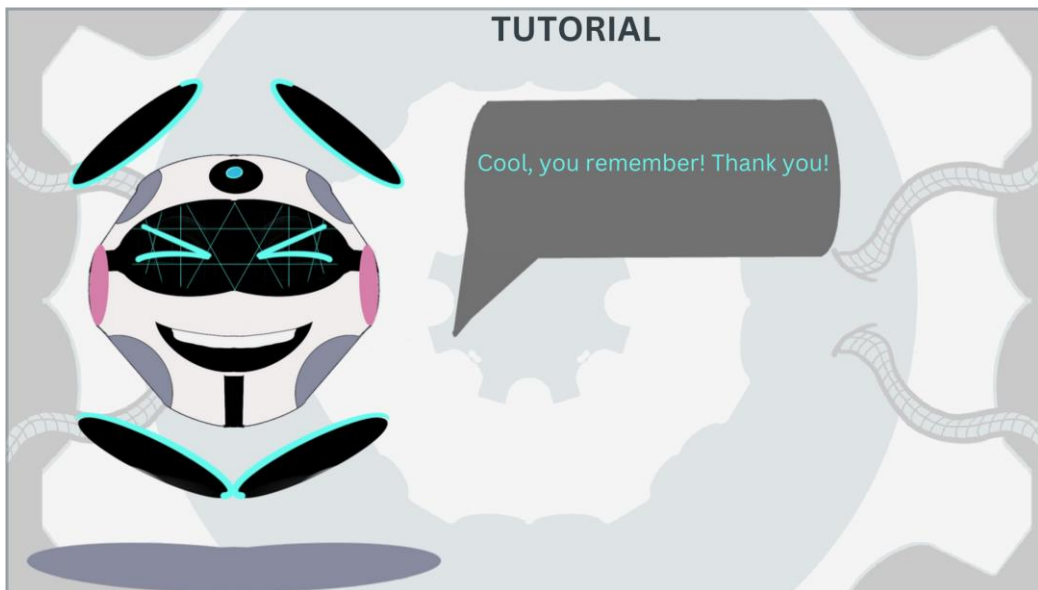
## Tutorial

### 17 Storyboard Tutorial 1 Question



The player chooses one of the three options

### 18 Tutorial 2a Feedback to the Question



Feedback to the correct answer

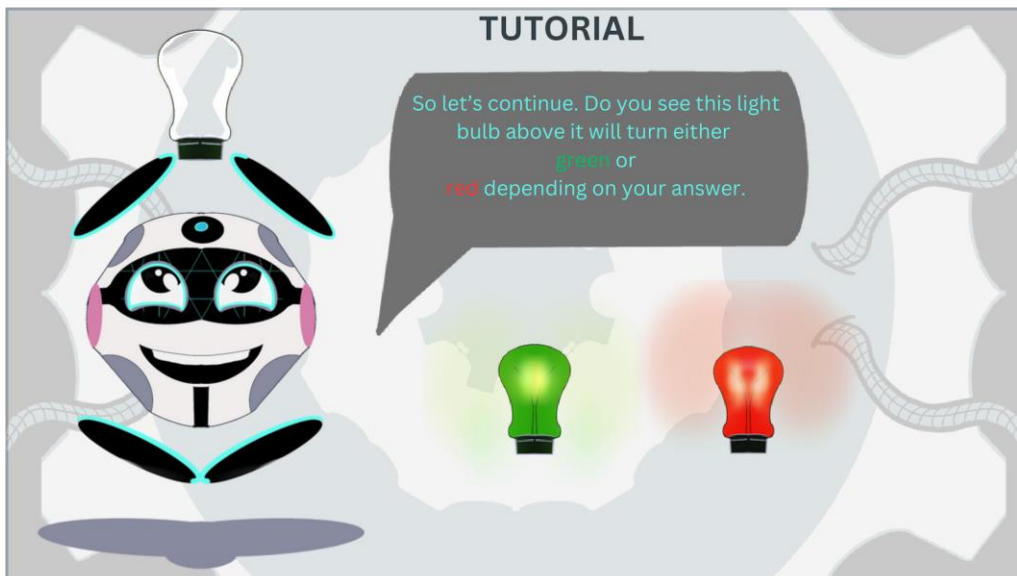


19 Tutorial 2b Feedback to the question



Feedback to the wrong answer

20 Tutorial 3 Light Bulb



The light bulb above the robot helps the player understand if the answer is right or wrong.

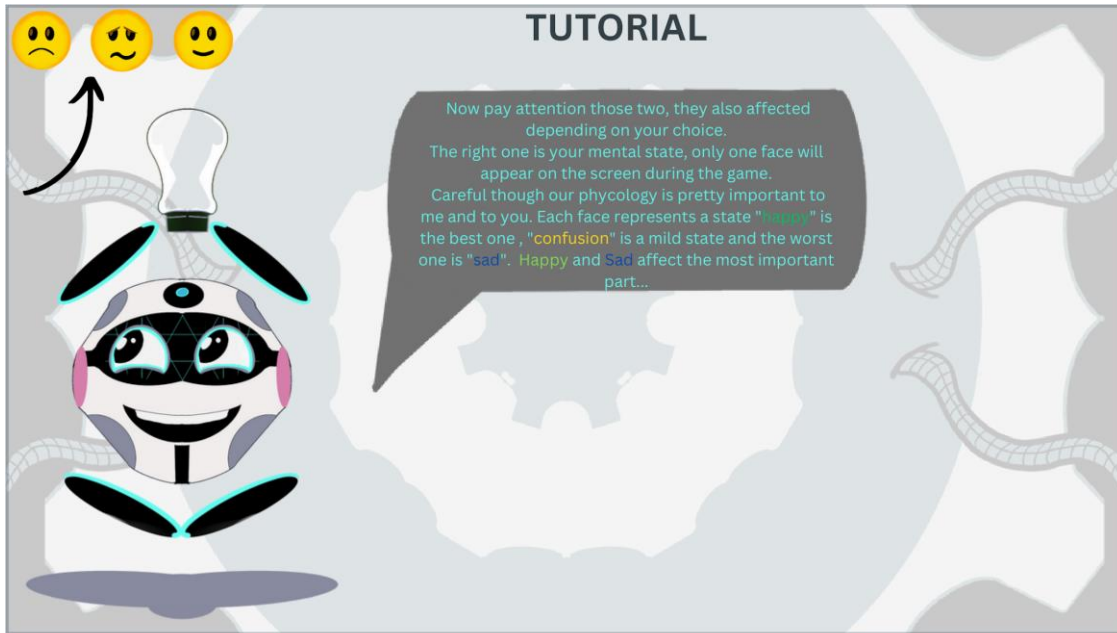
At this stage, the game character Shiloh provides an explanation regarding the significance of the accompanying light that indicates whether the answer to a question is correct or incorrect. The image accompanying this text visually portrays the presence of a light element within the game interface. Shiloh





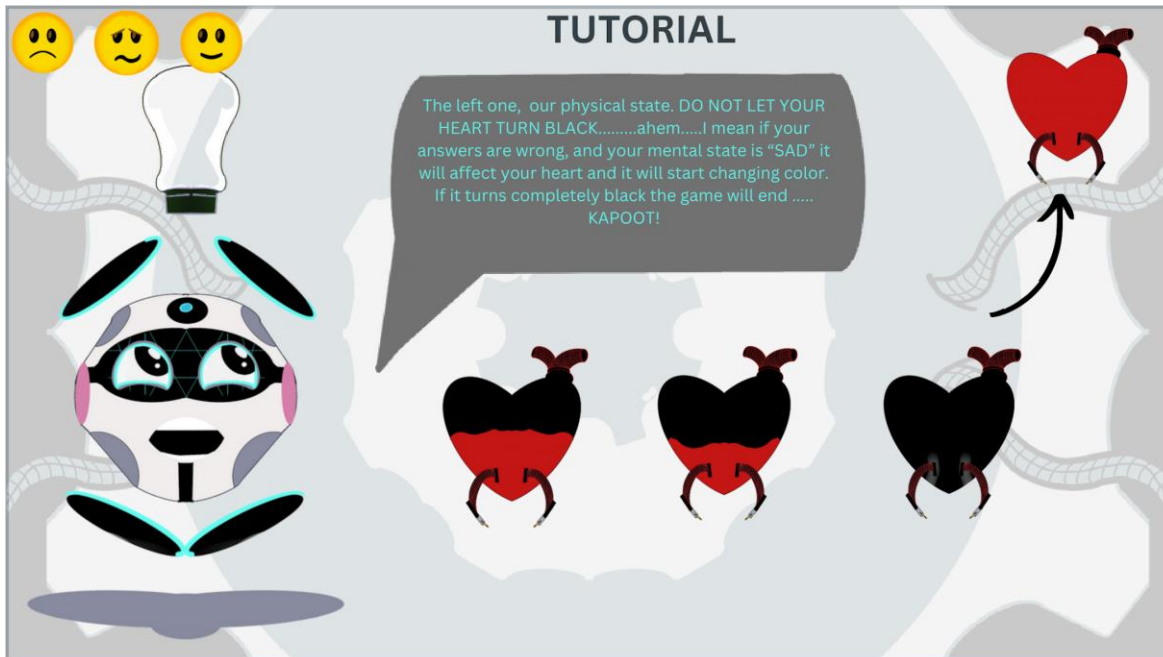
emphasizes the importance of this feature as it provides immediate feedback to the player, guiding them in understanding the accuracy of their responses.

#### 21 Tutorial 4 Psychology



At this particular point in the game, Shiloh takes the opportunity to explain the scoring system, starting with the Psychology Bar. The Psychology Bar is divided into three distinct phases Happy, Anxious and Sad each representing a different psychological state. Shiloh elaborates on the significance of these phases and their impact on the gameplay experience.

By explaining the scoring system and the role of the Psychology Bar, Shiloh enhances the player's understanding of the game mechanics. This knowledge empowers the player to make informed decisions and strategic choices, recognizing the importance of maintaining a balanced psychological state for optimal gameplay performance.



The health (physical state) has 4 states.  
When the hearth turns fully black the game ends.

After discussing the Psychology Bar, Shiloh proceeds to explain the second axis that has a significant impact on the game: the Physical Bar. Shiloh describes the Physical Bar as having four distinct stages, each representing a different physical state of the game character.

The accompanying visuals help illustrate the Physical Bar and its stages, providing a clear representation of the character's physical well-being. Shiloh emphasizes that the state of the Physical Bar directly affects the outcome of the game. If the heart symbol within the Physical Bar turns black, it signifies that the character's health has deteriorated to a critical level, resulting in the end of the game.

By explaining the significance of the Physical Bar and its connection to the game's outcome, Shiloh reinforces the importance of maintaining the character's physical well-being throughout the gameplay. This understanding prompts players to make choices that prioritize their character's health, contributing to a successful and prolonged gaming experience.



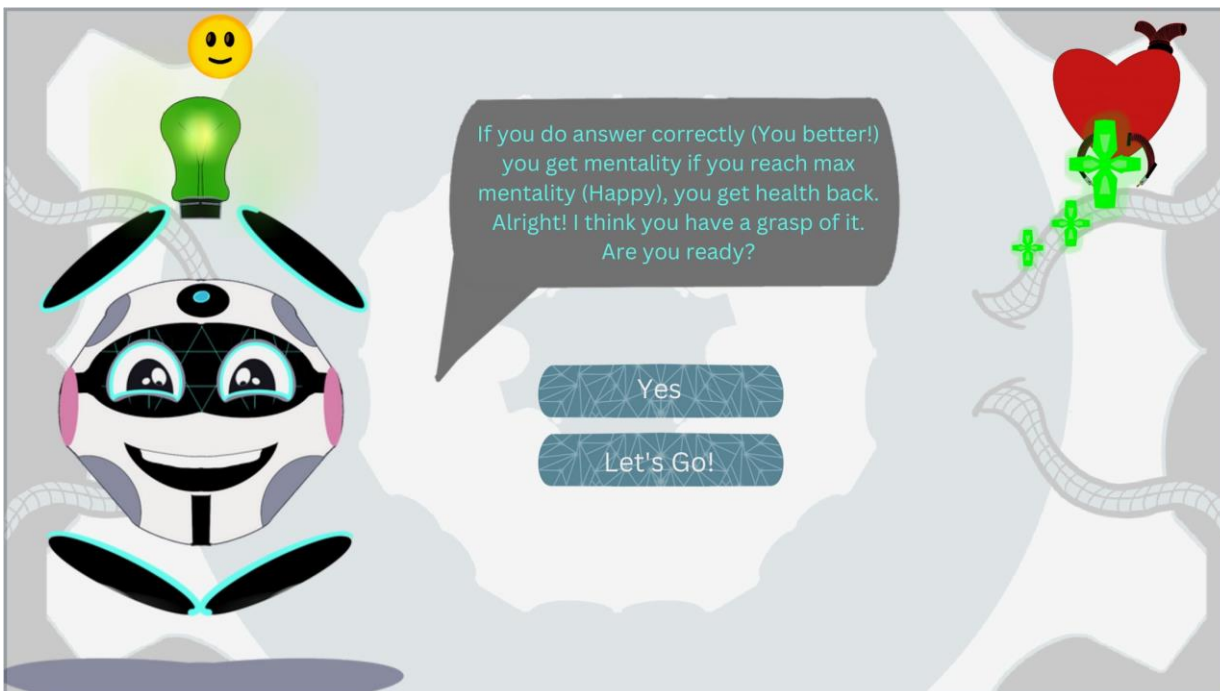


23 Tutorial 6



The robot Shiloh presents how you lose health in the game.

24 Tutorial 7



Shiloh presents how the player can get back health



25 Tutorial 8 Trial Question



Shiloh starts with simple questions that have no impact on the mental and physical state of the player.  
Providing feedback for each answer.

26 Tutorial 8a Trial Question



Feedback to the correct answer



27 Tutorial 8b Trial Question



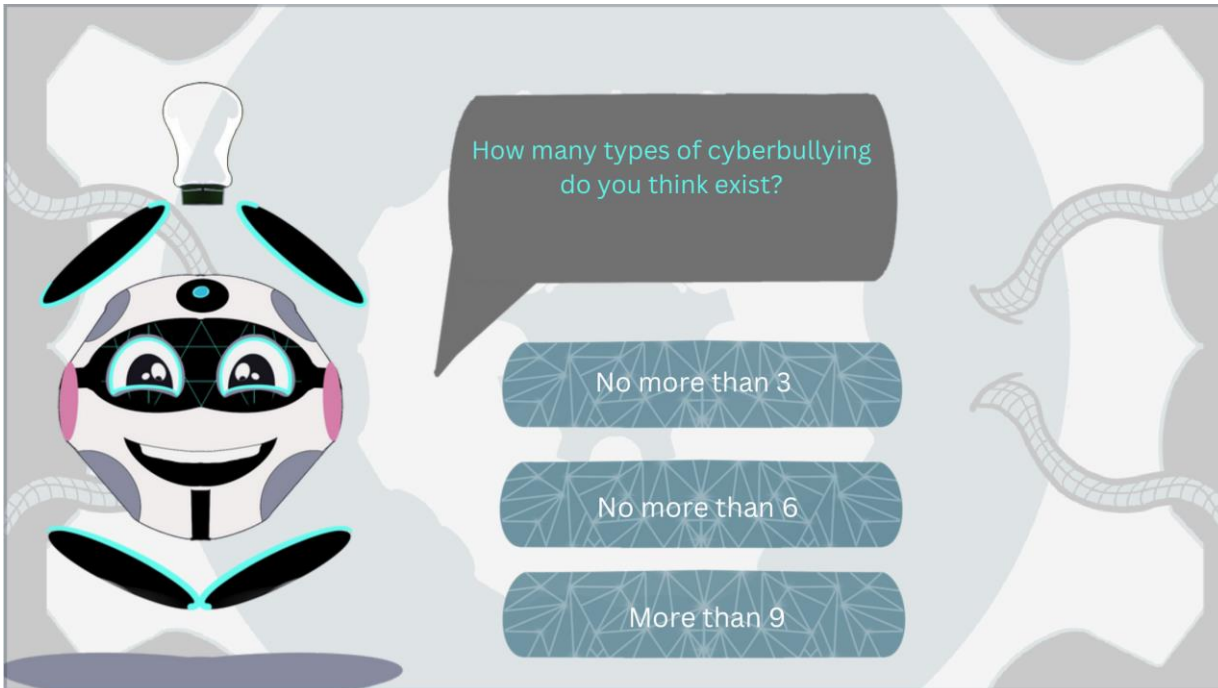
Feedback to the correct answer

28 Tutorial 9





29 Tutorial 10 Trial Question



Shiloh starts with simple questions that have no impact on the mental and physical state of the player.

Providing feedback for each answer.





30 Tutorial 10a Trial Question



Feedback to the correct answer

31 Tutorial 10b Trial Question





32 Tutorial 11



Shiloh starts with simple questions that have no impact on the mental and physical state of the player.  
Providing feedback for each answer.



## **Main Game**

The presented slides showcase a game scenario in which the player experiences defeat due to making mistakes. Shiloh, throughout the gameplay, provides warnings when the Physical Bar drops to a low level, indicating the character's deteriorating health. Eventually, the game reaches a point where the player's performance leads to a "game over" situation.

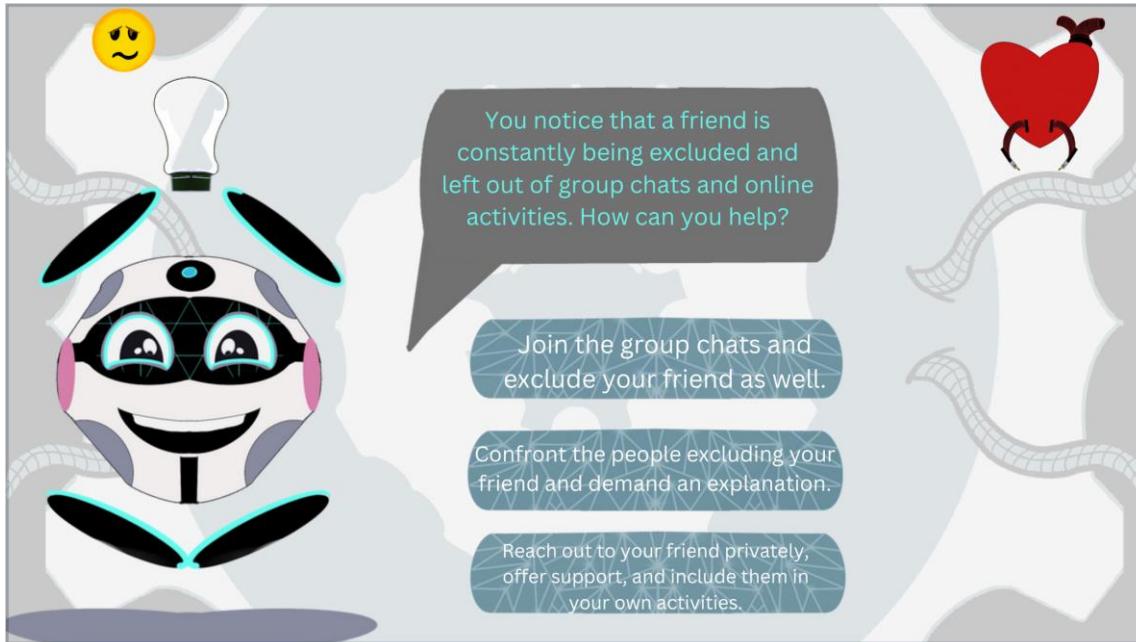
In the accompanying slide, a visual representation of the "game over" panel is presented. This panel offers the player an opportunity to retry the game, encouraging them to learn from their previous mistakes and make better choices in subsequent attempts.

By incorporating these elements into the game scenario, Shiloh serves as a guide, providing vital warnings and feedback to the player. The inclusion of the "game over" panel offers a chance for reflection and improvement, promoting a continuous learning experience within the game.

Overall, this game scenario and its accompanying slides effectively demonstrate the consequences of the player's actions, the importance of monitoring the Physical Bar, and the opportunity for growth through retries and improved gameplay strategies.



33 Main Game 1



34 Main Game 1a



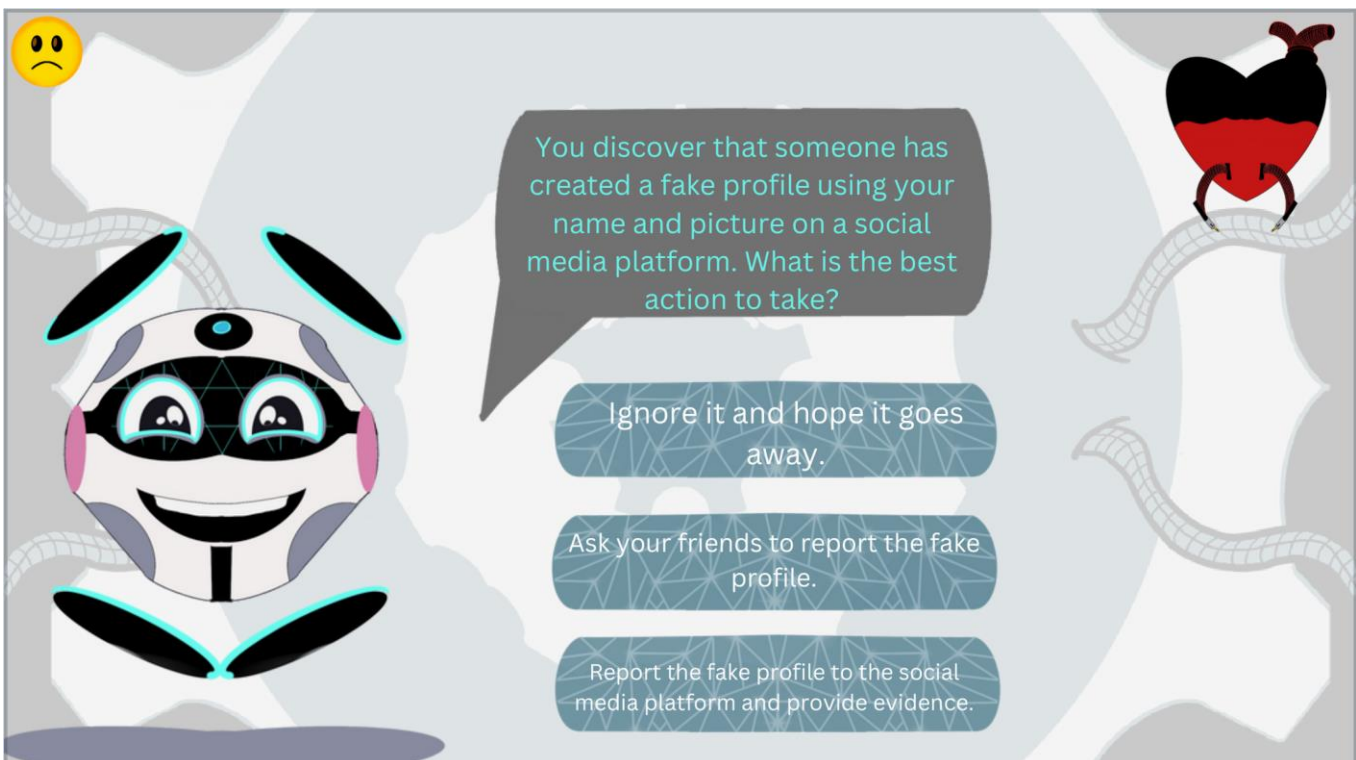




35 Main Game Warning a



36 Main Game 2





37 Main Game 2a



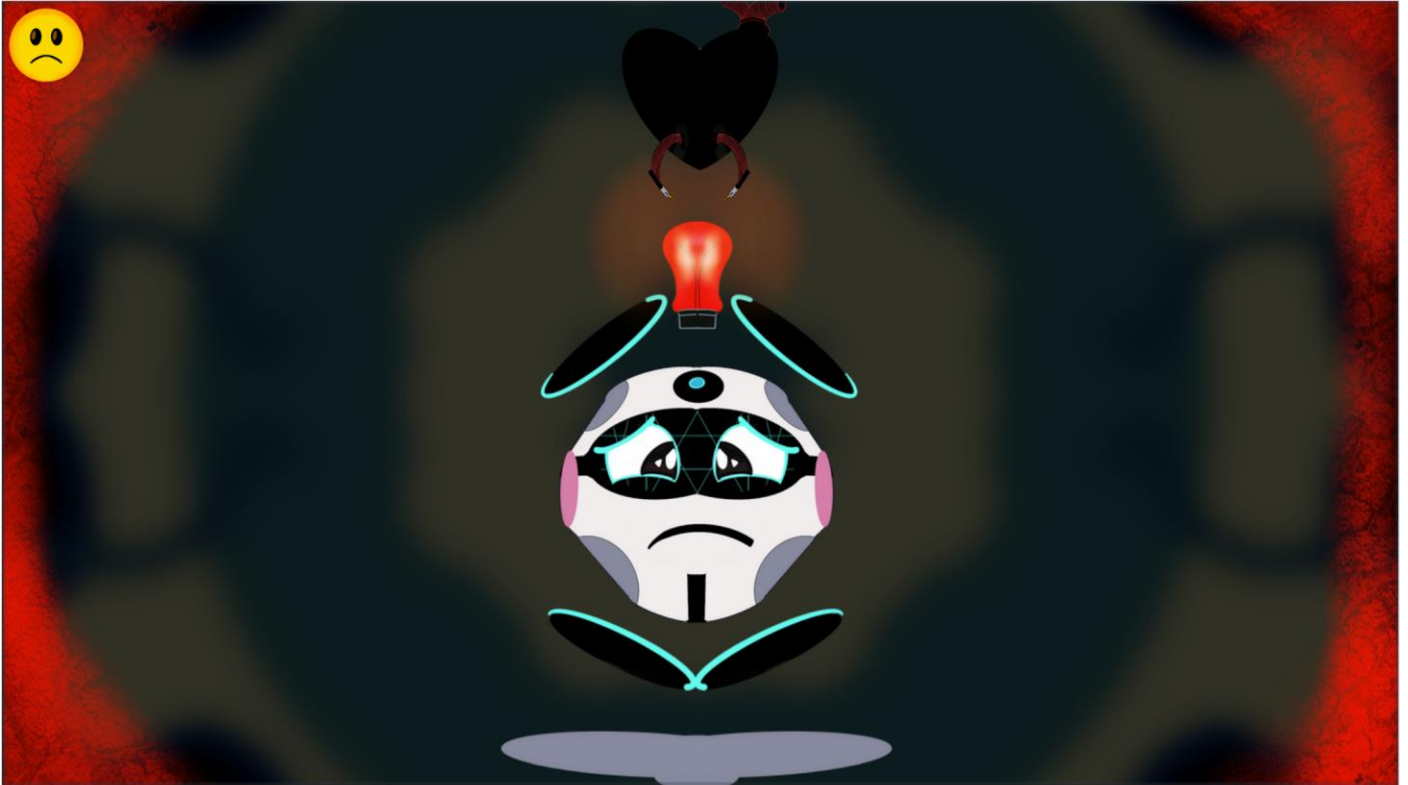
38 Main Game Warning b

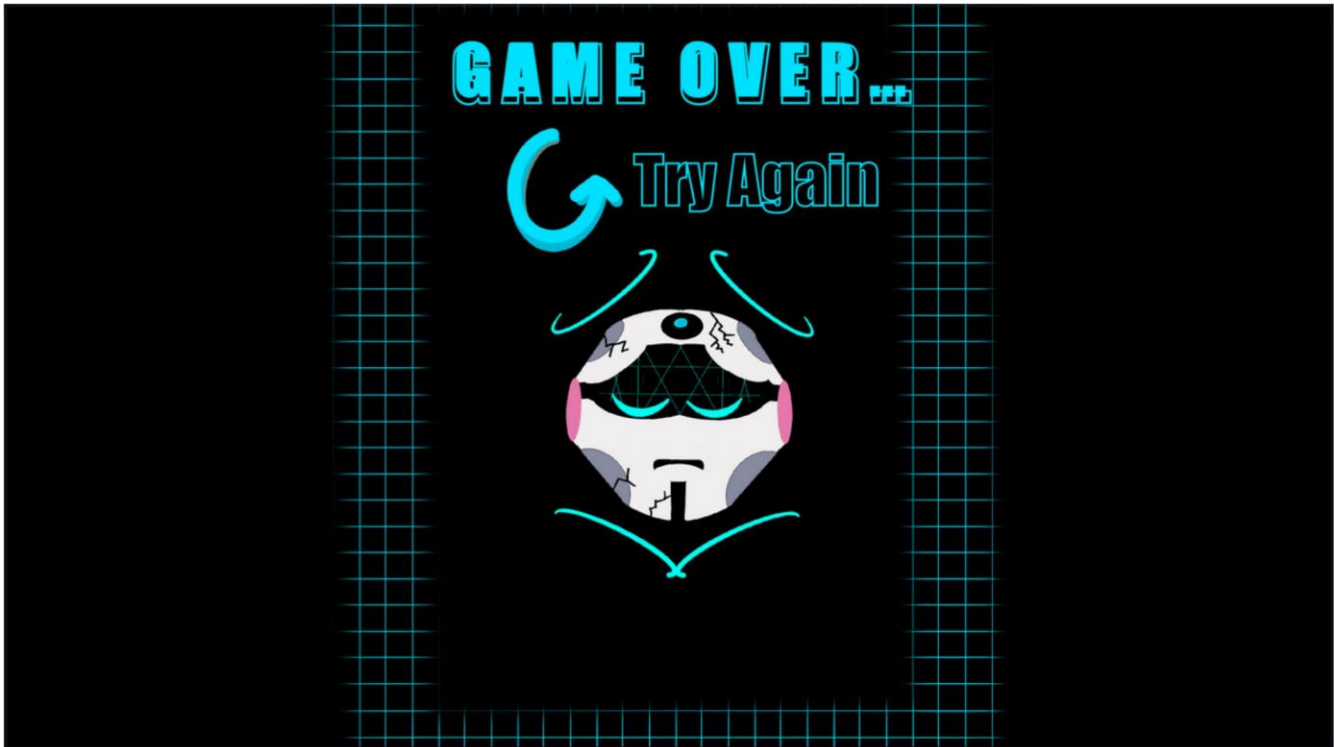




## Game Over

39 Game Over 1





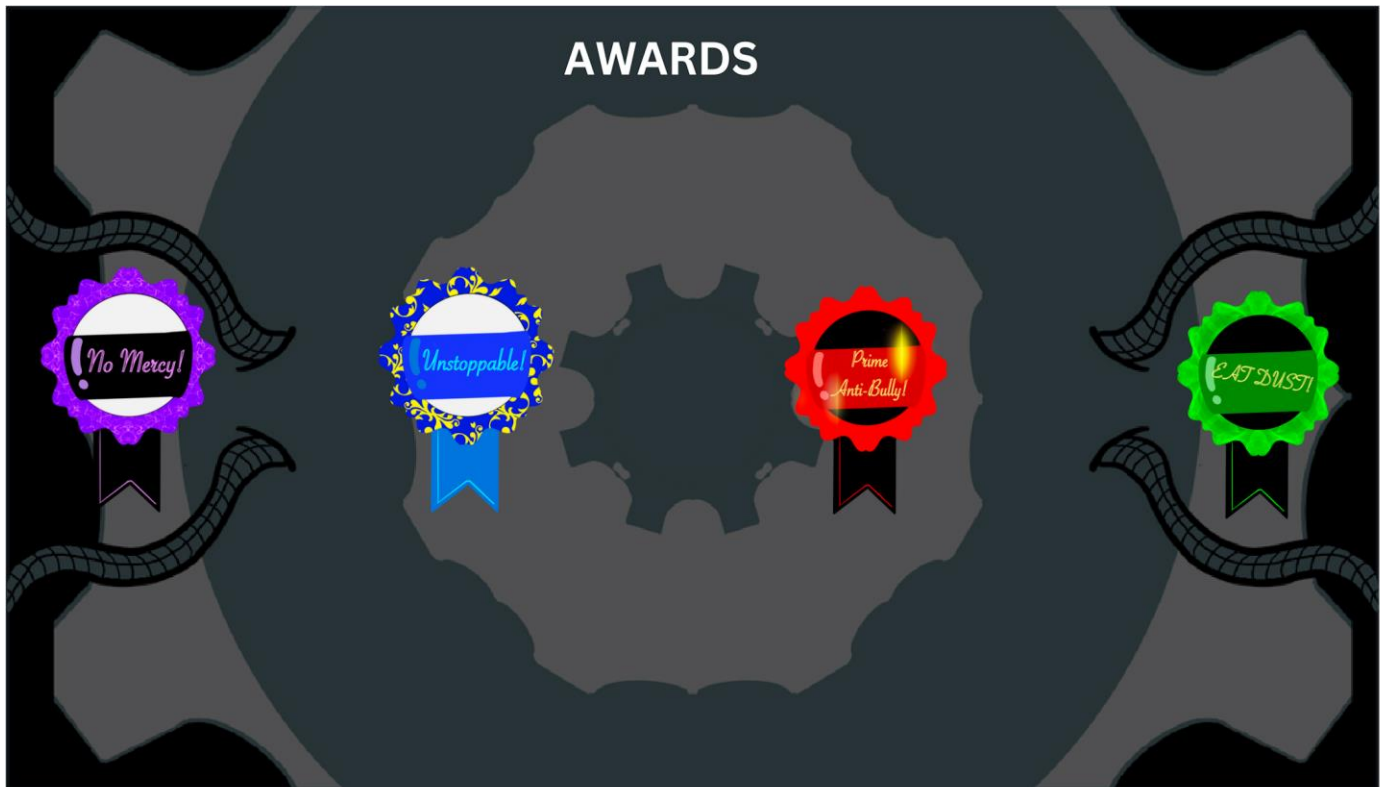
On the other hand, if the player successfully completes the game, regardless of their score, there are four awards that can be obtained based on specific conditions. These conditions serve as additional challenges and achievements for the player to strive for, enhancing the overall gameplay experience.

The conditions to achieve these awards are as follows:

1. Finish the game with only one point at the physical bar
2. Finish the game Under 5 minutes
3. Finish the game by correctly answering all of the game's questions
4. Finish the game under 10 minutes

By presenting these four awards, the game encourages players to revisit and replay the game with different strategies, aiming to fulfil these challenging conditions. The awards add an extra layer of achievement and motivation, further engaging players and promoting a sense of accomplishment upon successful completion of the game.





## 4.5 Elements and Components used in Unity

This chapter presents the design and implementation of an educational game that utilizes various Unity components to create an immersive and interactive learning experience. The game incorporates Canvas, Panel, GameObject, RawImage, Image, Button, TextBox, and AudioSource to deliver engaging content, provide visual elements, enable user interactions, and enhance audio experiences. The integration of these components serves as the foundation for creating a dynamic and engaging environment that promotes active learning and student engagement. This chapter explores the rationale behind the selection and utilization of these Unity components, their role in enhancing the educational game, and the impact they have on the overall learning experience. Furthermore, it discusses the development process, challenges encountered, and solutions implemented when integrating these components into the game. The findings from the evaluation of the game's effectiveness in facilitating learning are also presented, demonstrating the value of incorporating these Unity components into educational game design.



**Canvas:** In Unity, a Canvas is a container that serves as the root for all UI (User Interface) elements. It acts as a virtual plane where you can place and arrange UI components such as buttons, text boxes, images, and panels. The Canvas provides a coordinate system and rendering space for these elements, allowing you to position and manipulate them within the game view. It is a fundamental component for creating interactive and visually appealing user interfaces in Unity.

**Panel:** A Panel is a UI element that is typically used as a container within a Canvas. It helps to organize and group other UI elements together. Panels can be used to create sections or layouts within the user interface, allowing you to control the positioning and appearance of its child elements. They can be resized, positioned, and styled according to your design needs, and they provide a way to control the layout and hierarchy of UI elements within the Canvas.

**GameObject:** In Unity, a GameObject is the basic building block of the game world. It represents any entity or object within the scene, whether it's a character, a prop, a particle effect, or a UI element. A GameObject acts as a container for components, which define the behaviour and appearance of the object. In the case of UI, a GameObject can represent a UI element such as a button, image, or text box. It allows you to attach UI-related components, manipulate their properties, and interact with them programmatically.

**RawImage:** RawImage is a component in Unity that allows you to display a raw image or texture on the screen. It is often used to display images or textures that are not necessarily part of the game's 3D graphics but rather serve as UI elements. RawImage can be used to show icons, logos, or any other image-based content within the UI. It provides options for adjusting the texture's scale, position, and transparency, allowing you to control how it appears in the user interface.

**Image:** Image is a UI component in Unity that is used to display images or sprites within the UI. It is similar to the RawImage component but provides additional features and functionality specifically tailored for displaying UI graphics. With the Image component, you can easily load and display images or sprites from your project's assets. It supports various rendering options such as colour



tinging, transparency, and sprite slicing, making it versatile for creating visually appealing UI elements.

**Button:** In Unity, a Button is a UI component that allows users to interact with the game by clicking or tapping on it. It is typically used to trigger actions or events when pressed. Buttons can have various visual states, such as normal, highlighted, pressed, and disabled, and can be customized with different colours, images, and text. They are often paired with script components to define the behaviour and functionality of the button, enabling you to respond to user input and perform specific actions when the button is clicked.

**Text Box:** A Text Box, also known as a Text Input Field, is a UI component in Unity used to receive and display text input from the user. It provides an interactive area where users can type or enter text. Text Boxes can be used for various purposes, such as allowing users to enter their name, inputting chat messages, or creating search fields. They can be customized with different fonts, sizes, colours, and styles, and can be paired with script components to handle the input and perform actions based on the entered text.

**AudioSource:** AudioSource is a component in Unity that allows you to play and control audio within your game. It is used to generate sound from audio clips and control various aspects of audio playback. AudioSource is typically attached to a GameObject to define its audio behaviour. You can assign audio clips to the AudioSource, which can be music, sound effects, or voiceovers. AudioSource provides options to control volume, pitch, spatial positioning, and looping of the audio. It also allows you to play, pause, stop, and manipulate the audio in real-time. AudioSource is essential for creating immersive audio experiences and adding dynamic sound effects to your game.

## 4.6 Comparison to the Developed Game

### Main Menu

In addition to the features outlined in the Storyboard, the game incorporates additional functionalities to provide players with the ability to access more information or seek help in case of encountering cyberbullying situations. Apart from the Start, Quit, and Credits buttons, players have the option to click on each image presented within the game.



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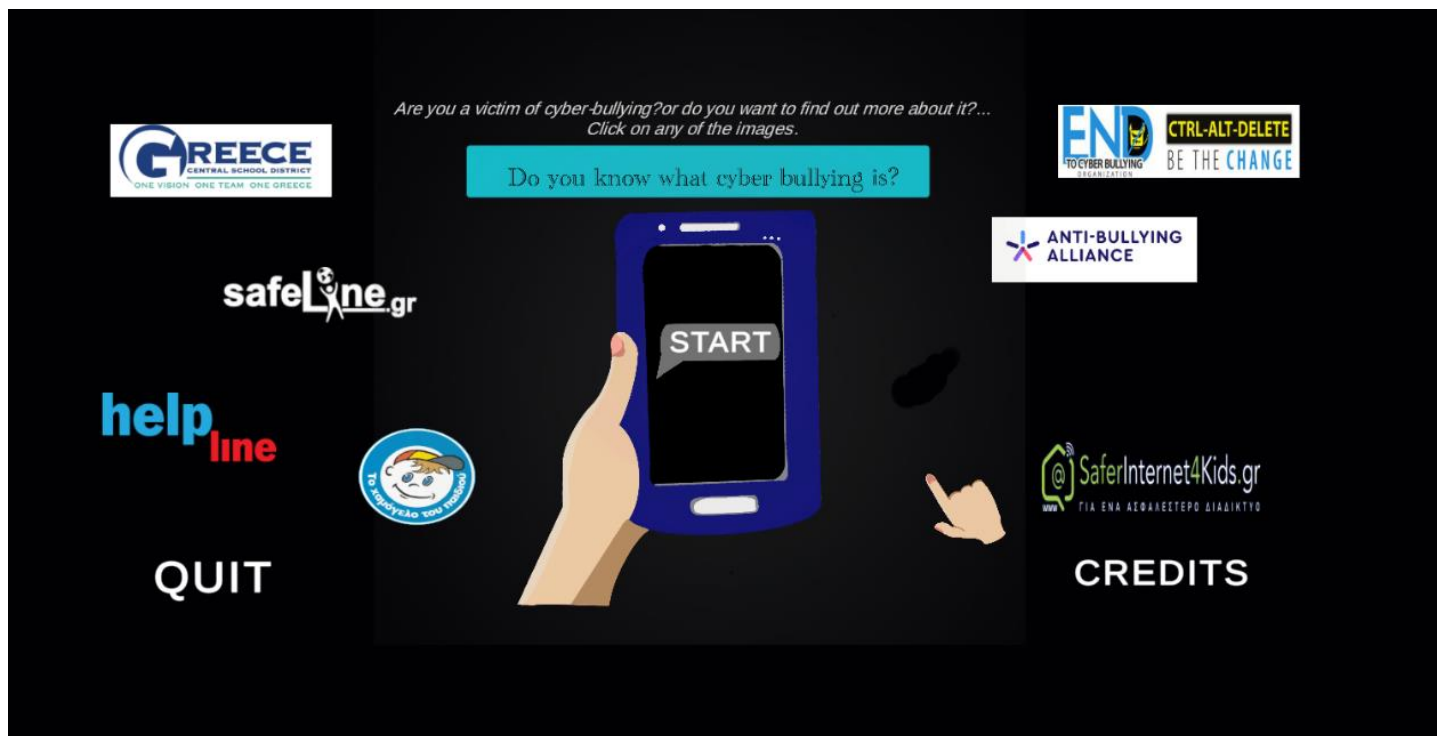


By clicking on these images, players can be redirected to the corresponding organization or website associated with each image. This feature enhances the educational aspect of the game, offering players valuable resources and support networks to further their understanding of cyberbullying and explore avenues for assistance.

Furthermore, to enhance the user interface (UI) and add visual interest, the game incorporates a unique feature where the mouse pointer is replaced by the image of a "Hand." This interactive element adds a playful and engaging touch to the UI, providing a more immersive and enjoyable experience for players.

By integrating these additional functionalities, the game goes beyond the core gameplay experience, encouraging players to explore external resources, seek help, and actively engage with the topic of cyberbullying beyond the game environment.

42 In Game\_Main Menu Panel



## Credits

Within the Credits Panel of the game, essential information is displayed pertaining to the Master Thesis. This includes details such as the project name, the name of the Master program, the student's name, and the name of the Supervisor who provided guidance throughout the thesis development





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process. Additionally, the Credits Panel also acknowledges the website that supplied the three sound effects incorporated into the game.

By including this information, the Credits Panel ensures proper attribution and recognition for the various elements and contributors involved in the creation of the Master Thesis and the game. It provides transparency and serves as a testament to the collaborative effort and resources utilized in the development process.

The inclusion of these details within the Credits Panel not only showcases the academic aspect of the thesis but also highlights the importance of acknowledging and crediting external sources and individuals who have contributed to the project's success.

43 In Game\_Credits Panel





## Introduction

The Introduction panel adheres to the design principles outlined in the Storyboard, maintaining a visually appealing layout. However, to cater to the target group of adolescents, the text within the panel has been broken down into smaller sentences for better readability and comprehension. This approach ensures that the information is more accessible and engaging for the intended audience.

To further enhance the interactive experience, a sound effect has been added to simulate how Shiloh, the game character, speaks. This auditory element adds a dynamic and immersive dimension to the introduction, captivating the players' attention and making the interaction with Shiloh more engaging and lifelike.

In addition, to provide players with more control over the pace of the conversation, a feature has been incorporated that allows them to rush through the dialogue by pressing the "Space Bar." This feature acknowledges the diverse preferences and engagement levels of players, providing an option for those who may prefer a faster pace or wish to expedite the conversation without compromising the overall game experience.

By combining these design elements, including broken-down sentences, a character-specific sound effect, and the ability to rush through the conversation, the Introduction panel successfully captures and maintains the interest of adolescent players, promoting their active involvement and enjoyment of the game.



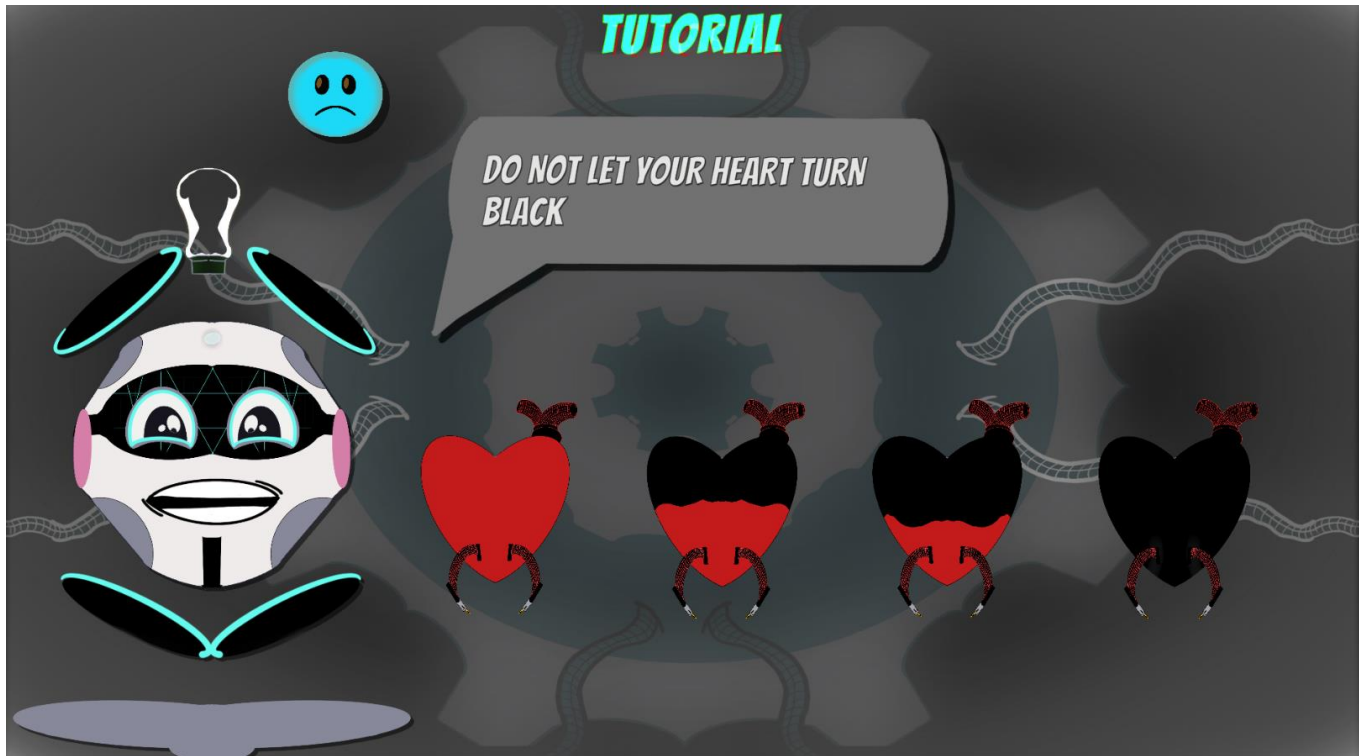


## **Tutorial**

Following the same approach as the Introduction Panel and the Storyboard, the Game Character Shiloh takes on the role of providing information on how the game is played, including trial questions. To ensure better comprehension for the player, the sentences within this section are also broken down into smaller, more digestible segments. This enables easier understanding and assimilation of the game mechanics and instructions.

Furthermore, during this phase, the player is introduced to the sound effects associated with correct and incorrect answers. These auditory cues serve as immediate feedback to reinforce the player's response. The Correct sound effect signifies a right answer, providing a sense of accomplishment and validation. Conversely, the Incorrect sound effect serves as a clear indicator of an incorrect response, signaling the need for further learning and improvement.

By incorporating these elements into the gameplay, the Game Character Shiloh effectively guides the player through the game mechanics, while the broken-down sentences facilitate comprehension. The introduction of sound effects adds an immersive layer to the experience, reinforcing the player's actions and outcomes. Overall, this approach enhances the overall engagement and educational value of the game, promoting a more interactive and enjoyable learning experience for the player.



## Main Game

Within the main game, in addition to the features outlined in the Storyboard, the player is provided with the opportunity to return to the main menu by simply pressing the designated button. This functionality allows for seamless navigation between gameplay and the main menu, enhancing the overall user experience.

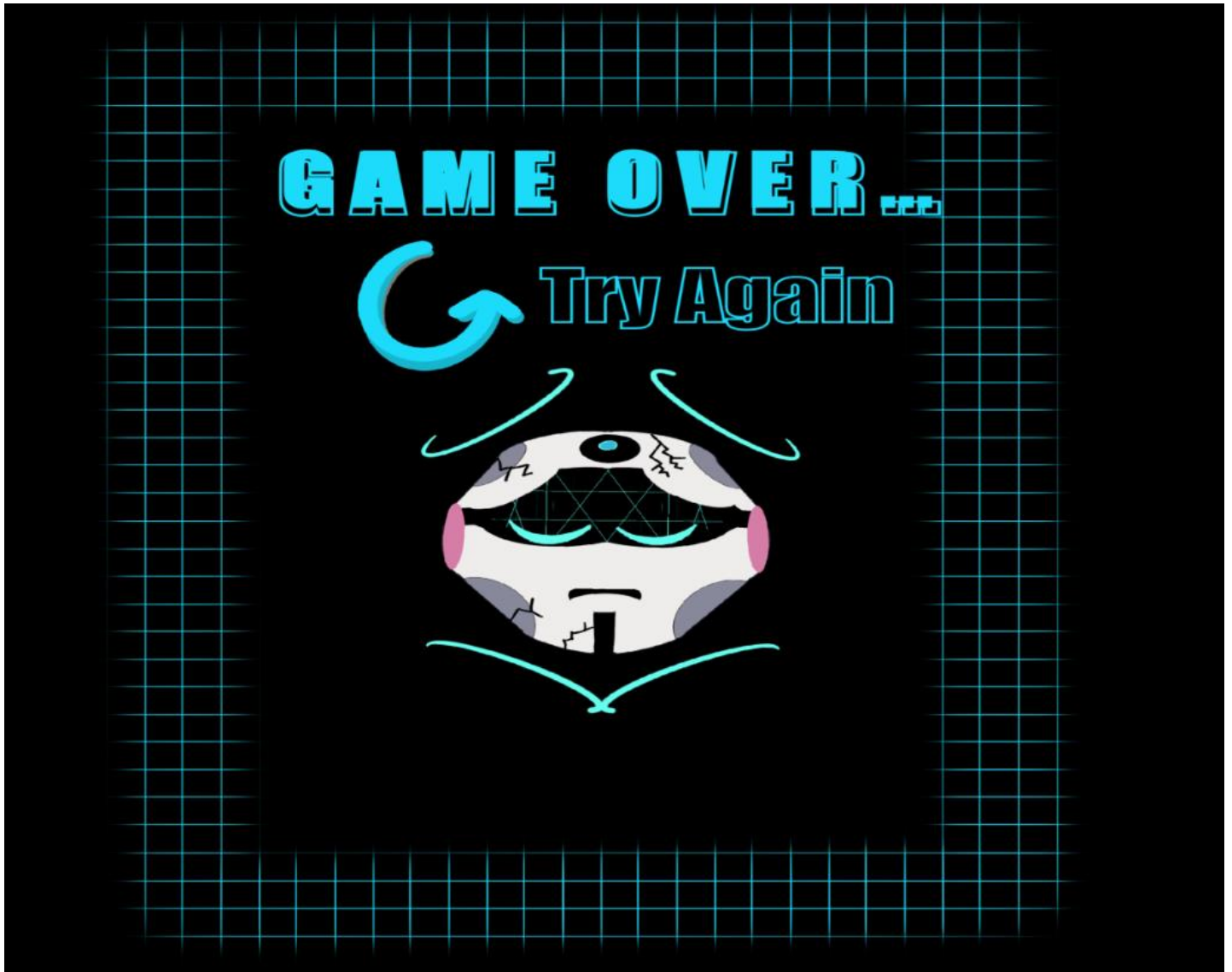






## Game Over

47 In Game\_Game Over Panel



## Awards

As depicted in the Storyboard, when the player completes the game, the Awards Panel is displayed, showcasing the medals that have been achieved throughout the gameplay. This visual representation of the player's accomplishments adds a sense of achievement and provides a tangible reward for their efforts.

In addition to the medals, two more buttons have been incorporated into the Awards Panel. The first button is the Main Menu button, which allows the player to return to the original panel where they can explore other features or access different sections of the game. This button offers convenience

[95]

Cyberbullying Symptoms and proper Response through an Educational Game in Unity.



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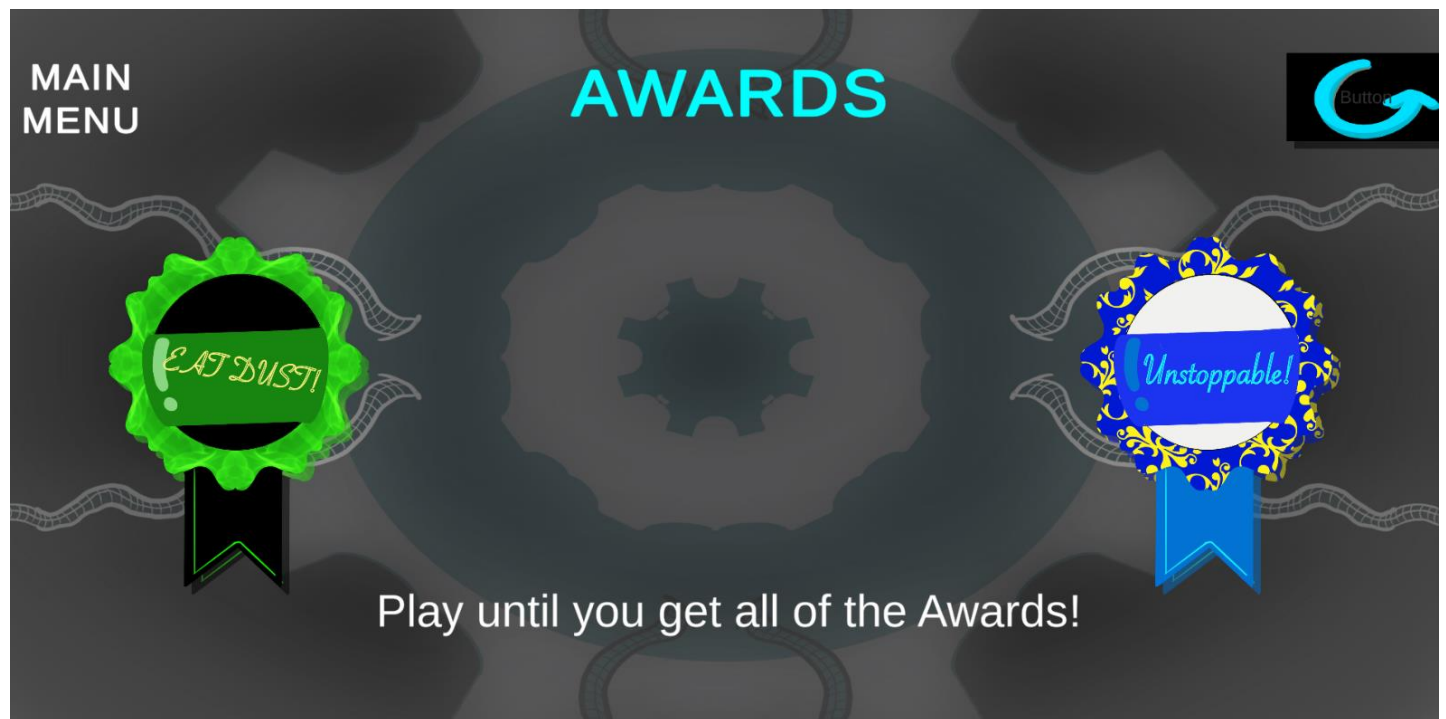


and flexibility, enabling players to navigate back to the main menu without having to close the game entirely.

The second button added is the Retry button, which provides players with the opportunity to replay the questions. This button allows them to revisit and reattempt the game, giving them the chance to improve their performance and further enhance their understanding of the subject matter.

By including these buttons within the Awards Panel, the game offers a seamless transition between different sections, allowing players to easily navigate through the game and make choices based on their preferences. These features enhance the overall user experience, providing convenience, motivation, and the opportunity for further engagement with the game's content.

48 In Game\_ Awards Panel







## Extras

In addition to the aforementioned details, such as dividing sentences, implementing the ability to rush dialogue by pressing specific keys, and incorporating sound effects, an array was created to encompass all the mouth expressions of Shiloh, the game's character. Through the utilization of an algorithm, the expressions dynamically changed based on each letter of the sentences, thereby adding the effect of realistic mouth movement during conversations.

*49 In Game\_ Sentence generation Algorithm Representation*



## Sounds

In the development of the cyberbullying game in Unity, three distinct sound effects were employed to enhance the overall gaming experience. The first sound effect aimed to simulate the voice of Shiloh, the game's character, when she engages in dialogue. This sound effect was carefully chosen to align with Shiloh's personality and create a more immersive environment for the players. Additionally, two sound effects were utilized to provide auditory feedback based on the player's responses. One sound effect signified a correct answer, reinforcing the player's knowledge and boosting their confidence. Conversely, the other sound effect indicated an incorrect answer, prompting players to reflect on their choices and learn from their mistakes. To ensure compliance with legal



requirements, all three sound effects were sourced from Freesound.org under License 0, allowing for unrestricted usage in the game.



## 4.7 Exploring Platforms for Uploading an Educational Cyberbullying Game in Unity

### Websites/Platforms

In the realm of educational game development, selecting the right platform for hosting a cyberbullying-focused game is pivotal. This essay delves into various platforms available for uploading such a game, including Newgrounds, along with other similar websites. The discussion will shed light on the unique advantages that make Newgrounds a standout choice.

When it comes to hosting an educational game created using Unity, several platforms and websites cater specifically to this purpose. Let's explore a few of these platforms and their characteristics:

a) Itch.io: Itch.io is a popular indie game hosting platform that emphasizes creativity and independent game development. It provides a platform for developers to share and sell their games while fostering a supportive community. Itch.io offers tagging and filtering options, allowing users to discover educational games among various genres.

b) Kongregate: Kongregate is an established online gaming platform that hosts a diverse range of games, including educational titles. It features a rating system, achievements, and community engagement through forums. Kongregate has a large user base, offering developers the potential for significant exposure and player feedback.

c) Game Jolt: Game Jolt is another prominent indie gaming platform that supports educational game uploads. It focuses on fostering community interaction and offers various features, such as game jams, contests, and developer resources. Game Jolt's user-friendly interface and active community make it an attractive choice for developers.

d) Newgrounds: Newgrounds is an online platform that showcases user-generated content, including games, animations, and music. It was established in 1995 and has grown into a vibrant community of creators and users passionate about interactive media. Newgrounds has gained recognition for its diverse and original content, encouraging creativity and experimentation.



## Advantages of Newgrounds

Among the available platforms, Newgrounds stands out as an excellent choice for uploading an educational game on cyberbullying. Here are the compelling reasons behind its prominence:

a) **Dedicated Community:** Newgrounds has cultivated a devoted community of gamers, animators, and artists who appreciate original and unconventional content. By uploading an educational game on Newgrounds, developers directly connect with an audience genuinely interested in engaging and interactive experiences.

b) **Artistic Freedom:** Newgrounds embraces creative freedom and encourages developers to explore innovative concepts and interactive storytelling. This aligns perfectly with the goal of creating an engaging educational game on cyberbullying, as it allows for unique approaches to presenting the content and fosters experimentation.

c) **Community Interaction:** Newgrounds provides an interactive platform where users can leave comments, provide feedback, and engage in discussions. This dynamic interaction allows players to share their experiences, offer insights, and even suggest improvements. Such community engagement is invaluable for refining the educational impact and overall quality of the game.

d) **Networking Opportunities:** Newgrounds offers networking opportunities by connecting developers and artists with similar interests. This opens doors for potential collaborations, knowledge sharing, and opportunities to expand the reach of the educational game through joint projects. The community-driven nature of Newgrounds facilitates connections within the industry.

e) **Discoverability:** While Newgrounds may have a smaller user base compared to mainstream platforms, it is renowned for showcasing unique and niche content. This distinctiveness enhances the discoverability and visibility of the educational game on cyberbullying, especially among an audience actively seeking new and innovative experiences.

In conclusion, selecting the right platform for hosting an educational game on cyberbullying is crucial to its success. While platforms like Itch.io, Kongregate, and Game Jolt offer specific advantages, Newgrounds stands out as a compelling choice. Its dedicated community, artistic freedom, interactive nature, networking opportunities, and emphasis on unique content contribute to an immersive and impactful experience for players. By leveraging the strengths of Newgrounds, the educational game can effectively educate and raise awareness about cyberbullying among its targeted audience.



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**Link of the Game:** <https://www.newgrounds.com/portal/view/889935>

**Website selected:** Newgrounds.com

**Name of the game:** Cyber-bullying



## Chapter 5

### 5.1 Limitations

Adolescent cyberbullying has emerged as a significant concern in recent years, necessitating effective interventions to mitigate its detrimental effects. One approach is the development of educational games, leveraging the power of technology and gamification to raise awareness and equip adolescents with the necessary skills to respond to cyberbullying. However, like any project, these games may encounter certain limitations that need to be acknowledged and addressed. This essay explores the limitations that can exist in an educational game designed to address adolescent cyberbullying symptoms and proper response in Unity.

One of the primary limitations lies in the platform compatibility of the game. Being developed specifically for the Unity game engine, the game's availability may be restricted to certain operating systems or devices. This can pose accessibility challenges for individuals using alternative platforms or older hardware, potentially limiting the reach and impact of the game.

Another limitation revolves around the technology requirements of the game. The game may necessitate specific hardware specifications or software dependencies to function optimally. This could present obstacles for users with limited resources or older devices, preventing them from experiencing the game seamlessly and hindering their engagement and learning process.

Given the complexity and sensitivity of cyberbullying, it is important to recognize that the game's content scope may be limited. While the game aims to cover various aspects such as recognizing signs, understanding impacts, and practicing response strategies, it may not encompass every nuance or variation of cyberbullying incidents. The focus is often on general principles and common scenarios rather than addressing every specific context or cultural variation.

The game's response system may provide generalized feedback based on the player's choices. While attempts are made to simulate real-life scenarios, it is challenging to capture the full complexity of individual situations or provide tailored guidance for specific cases of cyberbullying. Users may encounter limitations in receiving personalized responses or advice that precisely align with their unique circumstances.



Interactivity is a crucial element in educational games, but limitations may exist in terms of the game's mechanics and features. Players may have limited input or customization options, which can impact their immersion and sense of ownership. The game's linear nature and predefined scenarios may limit the extent to which players can actively engage and influence the outcome of their virtual experiences.

Considering the global nature of cyberbullying, cultural sensitivity is vital in educational games. However, the game's development and testing processes may primarily focus on a specific region or cultural background, potentially overlooking diverse cultural contexts and variations. Striving for inclusivity and cultural sensitivity may require further research and adaptation to better accommodate different perspectives.

While evaluating the immediate effectiveness of the game through user feedback and surveys is feasible, assessing its long-term impact on users' behaviors and attitudes towards cyberbullying may pose challenges. Conducting comprehensive follow-up studies or tracking user progress beyond the game environment may be complex and time-consuming, making it difficult to draw definitive conclusions about the game's sustained influence.

While educational games in Unity offer immense potential in addressing adolescent cyberbullying, it is crucial to acknowledge and address the inherent limitations they may face. By recognizing platform constraints, technology requirements, content scope, generalization of responses, limited interactivity, cultural sensitivity, impact evaluation challenges, and accessibility concerns, developers and researchers can refine and improve the educational game experience. Awareness of these limitations drives the pursuit of further research, fostering the growth of effective interventions to combat cyberbullying and support adolescents in responding appropriately to this prevalent issue.





## 5.2 Future Improvements

The development of an educational game in Unity to address adolescent cyberbullying symptoms and proper response is an ongoing process aimed at creating an effective and engaging learning experience. As the game evolves, several potential areas for future improvements have been identified. This essay explores these areas, highlighting opportunities for enhancing the game's audiovisual elements, interactivity, content, and rewards.

To further enrich the gameplay experience, the inclusion of additional sounds and sound effects can be considered. Currently, the game incorporates sounds for correct and incorrect answers, as well as the voice of the game character, Shiloh. By expanding the range of sounds, such as background music, ambient sounds, or specific audio cues during gameplay, players can become more immersed in the game world and its narrative.

The psychological and physical bars, as well as the scenes, could benefit from the implementation of animations and transitions. Animated visual elements can enhance the game's aesthetic appeal and provide visual feedback on the progress of the bars. Smooth transitions between scenes can contribute to a seamless and immersive gameplay experience, creating a more polished and professional presentation.

To enhance interactivity and user engagement, the buttons within the game can be made more interactive with hover triggers. When players hover their mouse over a button, it can trigger visual or audio effects, providing immediate feedback and enticing them to explore different options. Interactive buttons can create a sense of anticipation and encourage players to interact more actively with the game interface.

The dialogue of the game character, Shiloh, can be expanded to offer a broader range of information, advice, and guidance. By increasing the depth and variety of Shiloh's responses, players can gain a more comprehensive understanding of cyberbullying scenarios and the appropriate responses. This expansion can involve incorporating branching dialogue paths, allowing players to explore different conversation outcomes.

Expanding the range of questions in the game is crucial to cover a wider array of cyberbullying scenarios and potential dangers. By including a greater variety of questions, the game can better simulate real-life situations and help players develop a more comprehensive understanding of the





topic. Incorporating different types of cyberbullying incidents and addressing specific challenges unique to different demographics can significantly enhance the educational value of the game.

In addition to the medal awards currently provided to players upon completing the game, introducing additional rewards and achievements can further motivate and incentivize engagement. These rewards can be in the form of unlockable content, bonus levels, or virtual items that players can collect as they progress. By offering a sense of accomplishment and a tangible indication of progress, players are more likely to remain engaged and motivated to explore the game further.

Furthermore, in addition to the previously mentioned points, this project serves as a prototype available on an open platform. As a result, it allows adolescents, experts, educators, and psychologists to engage with it (by playing the game on Newgrounds) and offer valuable feedback, which will be crucial for its continuous enhancement and development.

In conclusion, as the educational game on adolescent cyberbullying continues to evolve, several areas for future improvements have been identified. Enhancing the audiovisual elements, interactivity, dialogue, question diversity, and rewards can contribute to a more engaging and comprehensive learning experience. By incorporating these future improvements, the game can continue to effectively educate and empower adolescents in responding to cyberbullying, ultimately leading to a safer and more inclusive online environment.

### **5.3 Conclusion**

In this chapter, we conclude our exploration and development of an educational game in Unity to address cyberbullying among adolescents. The purpose of this thesis was to create a game that educates and empowers adolescents to recognize and respond to cyberbullying effectively. Throughout the previous chapters, we have examined the problem of cyberbullying, existing interventions and prevention strategies, educational games, and the Unity platform. We have also discussed the process of creating the game and explored platforms for uploading it.

Through our research, we have gained a comprehensive understanding of cyberbullying, its various forms, and the signs and effects it has on adolescents. We have reviewed existing interventions and prevention strategies implemented in Europe and explored dedicated websites and platforms for reporting, preventing, and informing about cyberbullying. This knowledge has informed



the development of our educational game, ensuring that it addresses the specific challenges and needs of adolescents facing cyberbullying.

The examination of educational games and their potential in addressing cyberbullying has revealed the effectiveness of gamification in engaging and educating adolescents. We have identified existing games in the field of cyberbullying awareness and prevention and have leveraged Unity as a powerful platform for developing our own game.

The development process allowed us to conceptualize and visualize the game, create the necessary assets and components, and integrate them into Unity. The storyboard served as a guide, ensuring that the game's narrative and gameplay align with our educational objectives. The comparison between the developed game and the storyboard provided valuable insights into the implementation and potential improvements.

The developed game for cyberbullying prevention and awareness holds several contributions and implications. Firstly, it provides an interactive and engaging platform for educating adolescents about cyberbullying. By immersing players in realistic scenarios and challenging them to make informed decisions, the game enhances their understanding of the issue and equips them with appropriate responses.

The utilization of Unity as the development platform offers scalability and versatility, allowing for potential future expansions and improvements. The game's creation and documentation contribute to the growing body of knowledge in the field of educational games and cyberbullying prevention.

Furthermore, the exploration of platforms for uploading the educational game highlights the importance of making it accessible to a wide audience. Platforms such as Newgrounds provide an opportunity to reach adolescents and their caregivers, raising awareness and disseminating crucial information about cyberbullying.

Moreover, based on the development process and the analysis of the game, several recommendations for future enhancements and iterations can be made.

In conclusion, the development of an educational game in Unity for addressing cyberbullying has been a significant undertaking. By combining knowledge from research on cyberbullying, existing



interventions, educational games, and the Unity platform, we have created a game that educates and empowers adolescents to recognize and respond to cyberbullying effectively.

While the developed game represents a substantial contribution, there are still opportunities for future improvements and iterations. By continuously refining the audiovisual elements, dialogue, question diversity, and rewards, the educational impact of the game can be maximized. Furthermore, exploring other platforms for uploading the game will increase its reach and ensure that it reaches the intended audience.

Ultimately, this thesis serves as a foundation for ongoing research and development in the field of educational games for cyberbullying prevention. By leveraging the power of technology and gamification, we can continue to create innovative solutions that promote a safer and more inclusive online environment for adolescents.



## 4.6 Appendix

Quiz Manager (partial script of the main game)

```
public class QuizManager : MonoBehaviour
{
    public List<QuestionsAnswers> QnA; // calling the script with the questions, answers, feedback and correct answers
    public GameObject[] options; // array with the buttons
    public int currentQuestion; // in which question
    public TextMeshProUGUI QuestionText; // the text box of the question
    public int happiness; // an integer to measure the status of the mental bar Happy_Anxious_Sad
    public int health; // an integer to measure the status of the health bar 4 states
    public bool feedbackrecieved = false; // a bool to check wheter the feedback has generated
    public int ButtonClicked; // an integer to get the button which was clicked from the options array
    public GameObject AnswerPanel; // the panel of the answers
    public float DialogueSpeed; // speed with which the characters are displayed in the feedback
    public RawImage Heart; // Using texture to change the images of the health bar
    public RawImage Face; // Using texture to change the images of the mental bar
    public RawImage MouthS; // Using texture to change the expressions of the mouth
    public RawImage EyesS; // Using texture to change the expressions of the eyes
    public RawImage LightBulb; // Using texture to change the expressions of the light
    public bool AnsweredCorrect = false; // check is the question was answered correctly
    public GameObject DamageP; // panel to appear when the health bar drops
    public GameObject PlusH; // panel to appear when the health bar increases
    public GameObject SpaceBar; // text box with a tip to continue
    public GameObject Gameover; // panel to appear when the health bar reaches 0
    public GameObject InGame; // panel with in game content
    public int Score; // Score count
    public bool timerrunning; // Timer bool
    public float time;
    public TextMeshProUGUI TimeText;
    public bool TimeUnderTen;
    public bool TimeUnderFive;
    public bool Closecall;
    public GameObject Bonus;
    public GameObject Aw1;
    public GameObject Aw2;
    public GameObject Aw3;
    public GameObject Aw4;
    public int TotalQ;
    public AudioSource TalkS;

    // public int countpress =0 ;

    void Start() // what happens when the game starts
    {
        TotalQ = QnA.Count;
        generateQuestion();

        AnswerPanel.SetActive(true);
    }
}
```



```
happiness = 3;
health = 4;

DamageP.SetActive(false);
SpaceBar.SetActive(false);
GameOver.SetActive(false);
InGame.SetActive(true);
GameOver.SetActive(false);
PlusH.SetActive(false);
Bonus.SetActive(false);
Aw1.SetActive(false);
Aw2.SetActive(false);
Aw3.SetActive(false);
Aw4.SetActive(false);

Score = 0;

timerrunning = true;
TimeUnderFive = true;
TimeUnderTen = true;
Closecall = false;
feedbackrecieved = false;

MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[6];
EyesS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Eyes[2];
}
public void correct()// when we answer correctly after the feedback
{
    Score++;
    QnA.RemoveAt(currentQuestion);
    if (happiness==3)
    {
        if (health < 4)
        {
            health++;
            Heart.texture= GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Health_Bar[health -1];
            PlusH.SetActive(true);
            Invoke("SetFalsePH", 1.0f);
        }
    }
    else
    {
        happiness++;
        Face.texture= GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Mental_Bar[happiness - 1];
    }
    generateQuestion();
    // countpress = 0;
}
public void wrong()// when we answer wrong after the feedback
{
```



```
QnA.RemoveAt(currentQuestion);

if (happiness > 1)
{
    happiness--;
    Face.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Mental_Bar[happiness - 1];
    generateQuestion();
}
else
{
    DamageP.SetActive(true);
    Invoke("SetFalseDamage", 1.0f);
    if (health > 2)
    {
        health--;
        Heart.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Health_Bar[health - 1];
        if (health == 1)
        {
            Closecall = true;
        }
        // countpress = 0;
        generateQuestion();
    }
    else
    {
        health--;
        Heart.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Health_Bar[0];
        AnswerPanel.SetActive(false);
        timerrunning = false;
        Invoke("GameOver", 2.0f);
    }
}

}

void SetFalseDamage() // hides the panel
{
    DamageP.SetActive(false);
}
void SetFalsePH() // hides the panel
{
    PlusH.SetActive(false);
}
void GameOver() // called when the health bar reaches 0
{
    InGame.SetActive(false);
    Gameover.SetActive(true);
}

public void retry()
{
    SceneManager.LoadScene(SceneManager.GetActiveScene().buildIndex); // reloads the scene to retry
}
}
```



```
void DisplayTime(float timeToDisplay)
{
    timeToDisplay += 1;
    float minutes = Mathf.FloorToInt(timeToDisplay / 60);
    float seconds = Mathf.FloorToInt(timeToDisplay % 60);
    TimeText.text = string.Format("{0:00}:{1:00}", minutes, seconds);
}
private void Update() // if the space bar is pressed either proceeds to the next question or generates the feedback instantly
{
    if (Input.GetKeyDown(KeyCode.Space) && feedbackrecieved && !AnswerPanel.activeSelf)
    {
        SpaceBar.SetActive(false);
        feedbackrecieved = false;
        AnswerPanel.SetActive(true);
        EyesS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Eyes[2];
        MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[6];
        LightBulb.texture = GameObject.Find("QuizManager").GetComponent<Shiloh>().Light[0];
        if (AnsweredCorrect)
        {
            correct();
        }
        else if (!AnsweredCorrect)
        {
            wrong();
        }
    }
    else if (Input.GetKeyDown(KeyCode.Space) && !feedbackrecieved && !AnswerPanel.activeSelf)
    {
        feedbackrecieved = true;
        StopAllCoroutines();
        QuestionText.text = QnA[currentQuestion].Feedback[ButtonClicked];
        TalkS.Stop();
    }
    if (timerrunning && InGame.activeSelf)
    {
        time += Time.deltaTime;
        DisplayTime(time);
    }
}

void SetAnswers() // setting the answers in the buttons
{
    for (int i=0; i< options.Length; i++)
    {
        options[i].GetComponent<AnswerScript>().isCorrect=false;
        options[i].transform.GetChild(0).GetComponent<TextMeshProUGUI>().text = QnA[currentQuestion].Answers[i];
    }
    if(QnA[currentQuestion].CorrectAnswer== i + 1)
```





```
{
    options[i].GetComponent<AnswerScript>().isCorrect = true;
}
}
}
}
void generateQuestion() // generates the questions and if there are no more loads the next scene
{
    if (QnA.Count > 0)
    {
        currentQuestion = Random.Range(0, QnA.Count);
        QuestionText.text = QnA[currentQuestion].Question;
        SetAnswers();
    }
    else
    {
        InGame.SetActive(false);
        Bonus.SetActive(true);
        if (Closecall)
        {
            Aw2.SetActive(true);
        }
        if (TimeUnderFive)
        {
            Aw1.SetActive(true);
        }
        if (TimeUnderTen)
        {
            Aw4.SetActive(true);
        }
        if (Score == TotalQ)
        {
            Aw3.SetActive(true);
        }
    }
}
}
public void generateFeedback()
{
    TalkS.Play();
    QuestionText.text = string.Empty; // empties the text box
    AnswerPanel.SetActive(false); // hides the answer panel

    StartCoroutine(WriteSentence()); // starts generating feedback

    if (AnsweredCorrect) // change expression eyes and light based on answer (correct or incorrect)
    {
        EyesS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Eyes[0];
        LightBulb.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Light[2];
    }
}
```



```
}  
else  
{  
    EyesS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Eyes[1];  
    LightBulb.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().Light[1];  
  
}  
SpaceBar.SetActive(true);  
  
}  
IEnumerator WriteSentence() // writes the feedback character by character and changes the mouth texture depending  
on the letter  
{  
    foreach (char Character in QnA[currentQuestion].Feedback[ButtonClicked].ToCharArray())  
    {  
        QuestionText.text += Character;  
        yield return new WaitForSeconds(DialogueSpeed);  
        if (Character == 'B' || Character == 'M' || Character == 'P' || Character == 'b' || Character == 'm' || Character == 'p')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[1];  
        }  
        else if (Character == 'F' || Character == 'V' || Character == 'f' || Character == 'v')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[3];  
        }  
        else if (Character == 'L' || Character == 'l')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[4];  
        }  
        else if (Character == 'O' || Character == 'o')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[5];  
        }  
        else if (Character == 'Q' || Character == 'W' || Character == 'q' || Character == 'w')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[6];  
        }  
        else if (Character == 'U' || Character == 'u')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[7];  
        }  
        else if (Character == 'C' || Character == 'D' || Character == 'G' || Character == 'N' || Character == 'K' || Character  
== 'S' || Character == 'T' || Character == 'X' || Character == 'Y' || Character == 'Z' || Character == 'c' || Character == 'd' ||  
Character == 'k' || Character == 'g' || Character == 'n' || Character == 'k' || Character == 's' || Character == 't' || Character  
== 'x' || Character == 'y' || Character == 'z')  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[2];  
        }  
        else  
        {  
            MouthS.texture = GameObject.Find("Quiz Manager").GetComponent<Shiloh>().S_Expression[0];  
        }  
    }  
}
```



```
4 public class AnswerFeedbackTutorial : MonoBehaviour
5 {
6     public string Correct_Feedback;
7     public string InCorrect_Feedback;
8     public TextMeshProUGUI Button;
9     public TextMeshProUGUI Shiloh_Feedback;
10    private string Answer;
11    public float DialogueSpeed; //speed for the characters appearing
12    private string Feedback;
13    public GameObject AnswerPanel;
14    public Button[] Buttons;
15    public GameObject Dialogue;
16    public static bool DoneQ;
17    public RawImage MouthS;
18    public RawImage EyesS;
19    public AudioSource Talk;
20    public AudioSource Correct;
21    public AudioSource InCorrect;
22    private void Start()
23    {
24
25        Buttons[0].interactable = true;
26        Buttons[1].interactable = true;
27        Buttons[2].interactable = true;
28        DoneQ = false;
29    }
30
31    public void Onclick()
32    {
33
34        Answer = Button.GetComponentInChildren<TMP_Text>().text;
35        Buttons[0].interactable = false;
36        Buttons[1].interactable = false;
37        Buttons[2].interactable = false;
38        Talk.Play();
39
40        if (Answer == "SHILOH")
41        {
42            Feedback = Correct_Feedback;
43            Correct.Play();
44            EyesS.texture = GameObject.Find("Question Manager Tutorial").GetComponent<Shiloh>().S_Eyes[0];
45        }
46        else
47        {
48            Feedback = InCorrect_Feedback;
49            EyesS.texture = GameObject.Find("Question Manager Tutorial").GetComponent<Shiloh>().S_Eyes[1];
50            InCorrect.Play();
51        }
52
53        StartDialogue();
54        StartCoroutine(FinishALready());
55        DoneQ = true;
```



```
56     Talk.Stop();
57 }
58
59 void StartDialogue()
60 {//Dialogue function sets the int to 0 and starts the Writesentence function
61     Shiloh_Feedback.text = string.Empty;
62
63
64 }
65 IEnumerator WriteSentence()
66 {//breaks down the sentences to characters
67     foreach (char Character in Feedback.ToCharArray())
68     {
69         Shiloh_Feedback.text += Character;
70         yield return new WaitForSeconds(DialogueSpeed);
71         if (Character == 'B' || Character == 'M' || Character == 'P' || Character == 'b' || Character == 'm' || Character
72 == 'p')
73         {
74             MouthS.texture = GameObject.Find("Question Manager
75 Tutorial").GetComponent<Shiloh>().S_Expression[1];
76         }
77         else if (Character == 'F' || Character == 'V' || Character == 'f' || Character == 'v')
78         {
79             MouthS.texture = GameObject.Find("Question Manager
80 Tutorial").GetComponent<Shiloh>().S_Expression[3];
81         }
82         else if (Character == 'L' || Character == 'l')
83         {
84             MouthS.texture = GameObject.Find("Question Manager
85 Tutorial").GetComponent<Shiloh>().S_Expression[4];
86         }
87         else if (Character == 'O' || Character == 'o')
88         {
89             MouthS.texture = GameObject.Find("Question Manager
90 Tutorial").GetComponent<Shiloh>().S_Expression[5];
91         }
92         else if (Character == 'Q' || Character == 'W' || Character == 'q' || Character == 'w')
93         {
94             MouthS.texture = GameObject.Find("Question Manager
95 Tutorial").GetComponent<Shiloh>().S_Expression[6];
96         }
97         else if (Character == 'U' || Character == 'u')
98         {
99             MouthS.texture = GameObject.Find("Question Manager
100 Tutorial").GetComponent<Shiloh>().S_Expression[7];
101         }
102         else if (Character == 'C' || Character == 'D' || Character == 'G' || Character == 'N' || Character == 'K' ||
103 Character == 'S' || Character == 'T' || Character == 'X' || Character == 'Y' || Character == 'Z' || Character == 'c' ||
104 Character == 'd' || Character == 'k' || Character == 'g' || Character == 'n' || Character == 'k' || Character == 's' ||
105 Character == 't' || Character == 'x' || Character == 'y' || Character == 'z')
106         {
107             MouthS.texture = GameObject.Find("Question Manager
108 Tutorial").GetComponent<Shiloh>().S_Expression[2];
109         }
110     }
111 }
```



```
110     else
111     {
112         MouthS.texture = GameObject.Find("Question Manager
113 Tutorial").GetComponent<Shiloh>().S_Expression[0];
114     }
115 }
116 }
117 }
IEnumerator FinishAlready()
{
    yield return StartCoroutine(WriteSentence());
    AnswerPanel.SetActive(false);
    Dialogue.SetActive(true);
}
}
```



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