



DI5CIS

Promoting Interactive Learning Using 5G Networks and Synchronous Immersive Contents

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PRODEA
group





DI5CIS :: The project idea

- DI5CIS is an experimental project for the **production and delivery of innovative audiovisual content** based on advanced experiential modalities, articulated in **short video-interactive films** usable through a web platform
- The aim of the project is to prove the impacts of 5G technology on
 - **FRUITION** → mobile '*agility*' of highly complex and elaborate audiovisual content
 - **EFFECTIVENESS** → of content in terms of learning outcomes and quality of experience
- The idea behind the project is to **explore a new standard of enjoyment and production of audiovisual content that involves innovative technical and methodological elements**
 - We are not talking about Virtual Reality, we are not talking about 360 video, we are not talking about 3D content, we are not talking about Augmented Reality





Shown: **Swipe up** to levitate the book




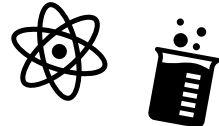
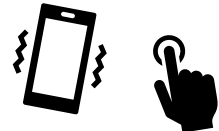

Pictured : The book rises from Leonardo's hands



In DI5CIS we talk about
INTERACTIVE REALITY



DI5CIS :: The four pillars

-  Interpenetration between the **game** and the **narrative** dimension (*storyfication*), aimed at motivating and engaging students → Digital Game-based Learning + Interactive Digital Storytelling
-  Disciplinary dimension translated into the development of interactive multimedia content for learning **Physics** and **Chemistry**, based on the fundamental elements of the STEM approach
-  Development choices defined by the **grammars of the multimedia products**, and the **user's possibility of interacting** by elements coherent with the content of the scene they are viewing
-  Technological layer that is the **integration of different elements** to provide a true immersive experience, from devices integrated sensors to the 5G network infrastructure

The **uninterrupted flow of the story** and a **user-narrative interaction** reinforce the **SENSE OF PRESENCE** in the plot



FUN AND PARTICIPATIVE LEARNING

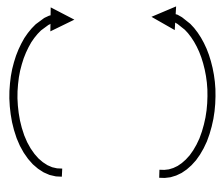


SHAKE LEFT
the liquid is NOT poured into the chemical ampoule – the liquid is still orange

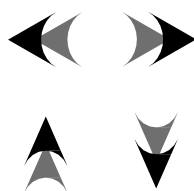


SHAKE RIGHT
the green liquid is poured into the chemical ampoule – the orange liquid turned into brown

MULTI-INPUT EXPERIENCE



HOURLY OR
ANTI-HOURLY
ROTATION



MULTIDATA
DIRECTIONAL



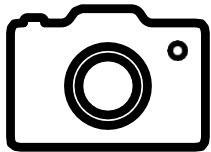
BIOMETRIC
SWIPE
PATTERNS



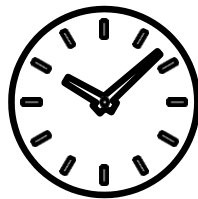
MICROPHONE



GEOLOCALISATION



CAMERA



TIME AND DATE



BATTERY
CHARGER



GYROSCOPE



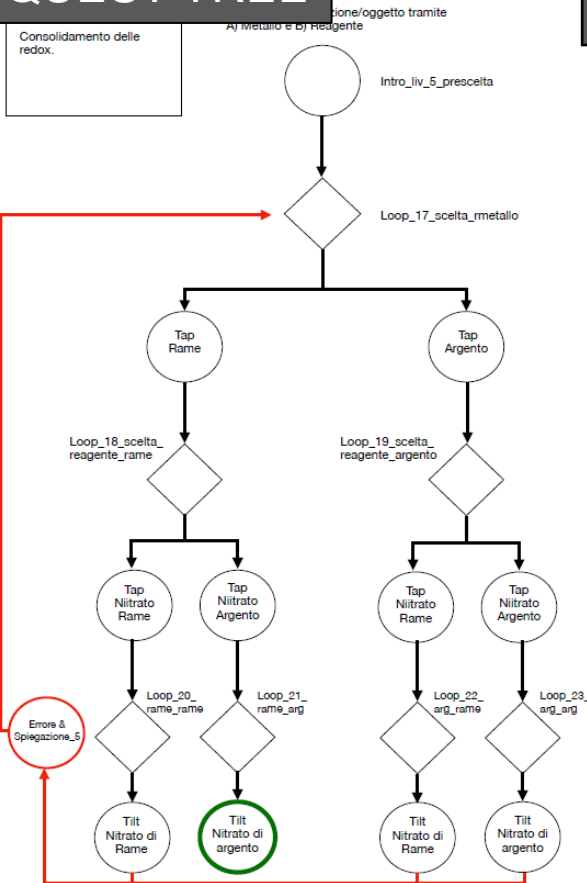
DI5CIS :: Artefacts development process

1. Two interactive stories were co-designed, inspired by the format of the **educational escape room**
 - **ChemiGame**, 7 levels (phase transition, latent heat, thermal expansion, ...)
 - **PhysiGame**, 8 levels (state functions, equations of state, first and second laws of thermodynamics, ...)
 - **Six teachers** were involved in the co-design of the two stories as subject matter experts
2. The two design documents were used to create the **quest trees** (i.e., flowcharting)
3. The two **screenplays** were created and validated by the teaching team
4. The two films were **professionally shot** in equipped film studios
5. The two **artefacts** were finalized





QUEST TREE



2

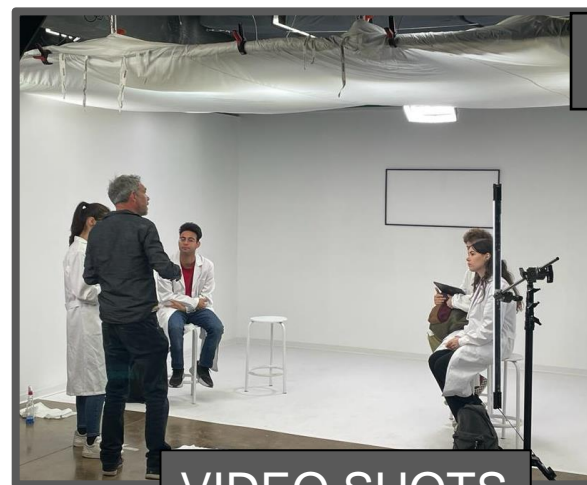
LIV.5

SCREENPLAY

3

A	B	C	D	
-	Inquadrature1	Inquadrature2	Descrizione scena	
	A1	POV	Zac è il clown della situazione oltre che videogamer compulsivo	Zac che gioca alla Play, Zac che scende le scale, Zac sullo skate dopo qualche tricks guarda in camera
	A1	POV	Anna è appassionata d' arte e letteratura infatti va bene in tutte le materie tranne fisica e chimica	Anna ascolta musica in cuffia mentre legge il libro poi si toglie le auricolari e guarda in camera, Anna si veste e cambia 3-4 abiti, Anna esce di casa con lo zaino
	A1	POV	Selene è la tipica party girl, va quasi tutte le sere a ballare, ama la musica e il divertimento;	Selene balla da sola in camera, Selene si tocca in bagno, Selene corre per prendere il bus
	A1	POV	Rami è il secchione della classe e studia anche al bagno.	Rami studia in bagno, Rami studia in cucina mentre mangia da una ciotola di cornflakes, Rami che scende le scale mentre studia da un libro di matematica, Rami cammina per strada sempre con un libro aperto
CG_PRO_TOT01	TOT senza tavolo	TOT	Sull'immagine della classe vuota compare il Logo animato DICIS. Poi entrano i ragazzi che vanno a sedersi su 4 sgabelli (Rami e Selene a dx del monitor, Anna e Zac a sx del monitor) NB danno le spalle al monitor	Alcune lab -za -ng Div -sco
CG_PRO_PP01		PP	Volto assonnato di Selene che si siede su uno sgabello (a dx del monitor)	
		PP	Zac si addormenta sullo zaino che ha messo sulle ginocchia (a sx del monitor)	
		PP	Anna si mette a leggere (a sx del monitor)	
		TOT	I ragazzi stanno morendo di sonno; ad un certo punto, si accende il monitor con dentro l'emoticon dello scienziato di whatsapp, i ragazzi SI GIRANO sorpresi verso lo schermo, il prof emoji spiega cosa sta succedendo;	
CG_prof_emoticon01		M	EVENTO SCATENANTE. Su uno schermo a tutto campo si materializza improvvisamente il faccione di Ned Flanders (o simile), a un id avatar del	Flanders: Rennyenti mi assunm che le vostre celluline prprio abbiani

4



VIDEO SHOTS

5

INTERACTIVE LIVE ACTION VIDEOS



ARTEFACT FINALIZED

CO-DESIGN



DI5CIS :: Study for data collection

- The two artefacts will be initially tested within **three classrooms**, 4th grade of High School, in **co-located situated learning activities**
 - **Self reported instruments** → **Pretest-posttest** (subjective methods)
 - **Game Learning Analytics (GLA)** → **User behavior tracker** integrated within the interactive stories

T1

- Study test in Chemistry and Physics
- Demographic data
- Study Strategies
- Study Approach
- Belief (motivation)
- Anxiety and Resilience

Game session

LEARNING + ENGAGEMENT

- GLA - Key Performance Indicators
- Subjective experience
- Cognitive load
- User Experience

T2

- Study test in Chemistry and Physics (*same of T1, one week later*)

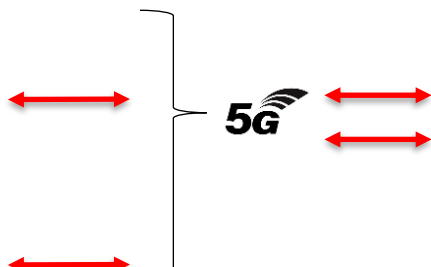
T3

- Study test in Chemistry and Physics (*same of T1, three months later*)

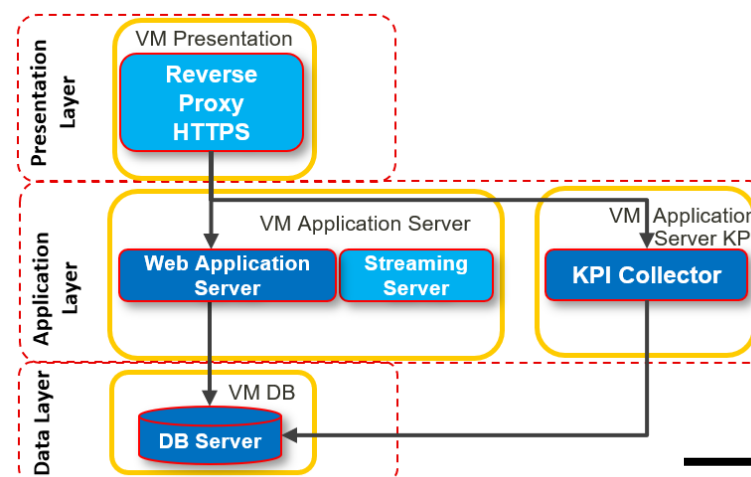




DI5CIS :: Anonymized data tracking



```
{
  performedAt: "2023-03-23T10:25:43.511Z",
  sessionId: "session_1234",
  deviceId: "73cbc572-15a4-4e7c-ad93-f160fcdae1d2",
  userGroup: "Group_3",
  userProfile: "Profile_A",
  experienceId: "ChemiGame",
  questId: "loop_9_choose_bleach",
  choiceId: "shake_bleach",
  secondsTaken: 9.5764,
}
```



KPI -> Quantitative data from logs

1. Students' Learning Performance

Attempts (number of tries used by the student for a specific question in the app), time (total amount of time spend using the app on a question), device id, use of hints (features that indicates if a student used the hints resource to answer a question)

2. Students' Engagement

Percentages of students completing easy levels, medium levels, hard levels

RESEARCHERS

- Definition of specific variables for different dimensions of analysis
- Identification of behavior patterns associated with students' profiles
- Predictive modelling (correlation with T1)

TEACHERS

- *Stealth* assessment
- Learning process evaluation
- Individual feedback





Thank you for your attention

Any question? 😊

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