Exploring game design approaches through conversations with designers

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This paper explores game designers' attitudes and praxis through a Grounded Theory analysis of data collected from interviews with 11 game design professionals. The aim of the research is to investigate and map possible shared approaches and strategies. The study presents a theoretical framework based on the core category "Balancing permanence and change". Designers appear to build and maintain elements of stability, and contemporarily ensure the process' flexibility and adaptability to possible constraints through collaborative approaches and iterative methods. The findings contribute to a deeper understanding of game design practices and provide a theoretical framework for interpreting designers' choices. Future research should assess the adaptability of the framework across game genres and cultural backgrounds of designers.

Keywords: design practice, research methods, design studies, human–computer interaction, user-centred design

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When considering design and its ramifications in different contexts and disciplines, the field of game design caught increasing attention across the scientific and professional communities, especially with reference to digital games (Martin, 2018). Following Cross's (1999) framework of design research, the growing production of knowledge on games responded to the need of discussing the epistemology, praxeology and phenomenology of this practice to identify and articulate a proper design reflection on this field. The call for theoretical frameworks to orient game design traces back to Church (1999), who underlined how the absence of

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formal frameworks would inhibit design knowledge building and evolution. According to Alexander (1964), it is possible to distinguish between *unselfconscious* and *self-conscious* design. The first refers to the reiteration of informal design rules, lacking an explicit theory or shared principles. The latter resounds with a separation between design thinking, that is to say "the ways in which designers approach design problems" (Gestwicki & McNely, 2012, p.2), and practical making. This separation would allow the designer to creatively reflect upon their practices.

As game studies was increasingly being recognised as a legitimate academic discipline, the establishment of a cohesive framework for digital games assumed paramount importance (Ralph & Monu, 2015). However, the dynamics through which theoretical frameworks and game designers' practices reciprocally affect each other are yet to be thoroughly explored from a scientific perspective. The collection of bottom-up insights on game design can foster the exploration of a self-conscious approach, unveiling a shared understanding that could orient practitioners. Multiple studies in literature attempted to gain knowledge on design through different qualitative approaches, such as observation (Karlsson et al., 2023), move analysis (Krishnakumar et al., 2022), and interviews. Although interviews appear to be one of the most effective qualitative techniques to collect data on specific topics (Creswell & Poth, 2016), existing studies appear to focus on other design disciplines (e.g., Schwier et al., 2004; Zannier et al., 2007) or specific aspects of game design (e.g., Crilly, 2015; Herring et al., 2009, pp. 1–10; Karlsson et al., 2023; Kultima et al., 2016), rather than the entire game design process. Additionally, existing interviews conducted with game designers take place within non-scientific contexts (such as magazines or online blogs and social events[1]). As a consequence, game designers' practices and approaches appear to be mostly unexplored throughout interview-based qualitative approaches.

Our study aims at filling this research gap by investigating and mapping designers' attitudes (Rosenberg & Hovland, 1960) and praxis (White, 2007; Zuber-Skerritt, 2001) through a qualitative interview-based research and the Grounded Theory analysis method (Charmaz, 2014). Specifically, the exploration focused on discovering possible shared design approaches, relevant factors influencing designers' decision-making and specific aspects connected to game design. The results could contribute to a deeper understanding of game design theories and practices throughout a bottom-up approach. The study can also provide systematised knowledge on this specific design field with an original and novel perspective, relying on practical experiences and guiding game design research and practice with grounded indications. The adopted approach guarantees the replicability of this study, paving the way for further research on this area.

The central question upon which this research is based is whether it is possible to identify a common pattern in the practices and praxis adopted in digital game design. Accordingly, the Research Question of this study is the following.

- RQ: Can scientific research derive explicitly or implicitly a shared and recognised game design approach and a set of practices from designers' experiences? If so, which ones are they?

The paper is structured as follows: Section 1 provides a research background on definitions and features of digital games, as well as general and game-specific design frameworks. Section 2 illustrates the adopted research method and Section 3 presents the findings of the study. Section 4 contains a discussion of presented results, while Section 5 draws the conclusions of the study identifying limitations and further research lines.

1 Game design definitions and knowledge

Alongside the spread of digital games, numerous scientific works aimed at systematising the knowledge on video games by offering theoretical perspectives on related definitions, relevant features and design approaches.

With reference to definitions, "digital games" is generally used as a wide term to include "computer games" and "video games" (Hsiao, 2007, pp. 124–129), "played on any platform, online or offline" (Vorderer & Ritterfeld, 2009, p. 456). Due to its broadness, the term "digital games" can also encompass serious games (Djaouti et al., 2011, pp. 25–43; Laamarti et al., 2014). The concept of "video game" has evolved significantly over time, leaning towards a more abstract and technology-associated idea in popular usage (Wolf, 2007). Newman (2004) adopted the definition of video games as "any form of computer-based entertainment software […], using any electronic platform […] and involving one or multiple players in a physical or networked environment" (p.27), extending it by recognising the direct participation of the user as a key feature of video games. As a matter of fact, interactivity is an inherent feature of games compared to other media such as books or films. While the latter are predetermined and non-interactive, games offer interactive experiences in which player's choices influence their outcome (Vorderer & Bryant, 2012).

Concerning relevant features, multiple studies offer perspectives that vary in their scope and method. Church (1999), through his Formal Abstract Design Tools (FADT), identified three main dimensions that game designers should be aware of when developing games: *player intention* (i.e., the degree of freedom to which the player can pursue their goals), *perceivable consequence*

(i.e., the feedback of the game to the player's action) and *story* (i.e., the narrative line that unfolds through the game experience). Such aspects, derived from the analysis of existing games, would serve as theoretical tools to understand video games' characteristics and thoughtfully design them in terms of players' experience. Bjork et al. 's (2003) Game Design Patterns (GDP) model, represents a framework to design and analyse digital games based on their components and dynamics. The authors recognise the existence of shared models (i.e., *game design patterns*) that designers can refer to and adapt in the design and development of a videogame according to their needs (e.g., paper-rock-scissors game-pattern, characterised by absence of winning strategy and tension) (Björk et al., 2003). Hunicke et al. (2004) illustrated a game design model that identifies three main elements: mechanics, dynamics and aesthetics (MDA). Such aspects respectively deal with game static rules, its run-time and the player's emotional reaction.

With reference to game design approaches, scientific literature offers both general and discipline-specific frameworks. Among the multitude of design thinking models, 4 models stood out and paved the way for numerous follow-up models (Waidelich et al., 2018): the IDEO's 3 I model (Brown & Wyatt, 2010), the 4D or Double Diamond model (Design Council, 2024), the Hasso Plattner model (Hasso-Plattner-Institut, n.d.), and the Stanford model (Hasso Plattner Institute for Design at Hasso Plattner Institute of Design at Stanford, n.d.). In 2001, IDEO developed the 3 I's design thinking model, consisting of overlapping spaces rather than sequential steps, to better reflect the flowing nature of design thinking: *Inspiration*, *Ideation*, *Implementation*. The *Inspiration* space involves identifying the design problem or opportunity through observation and design research. A synthesis process, along with a brainstorming session, encourages the generation, development and testing of ideas (*Ideation* space). In the third space, *Implementation*, the best ideas are actualised through the core activity of prototyping and are then tested, iterated and released (Brown & Wyatt, 2010). The 3 I's model provided a design framework that could address complex societal issues (e.g., healthcare or learning environments) in the context of social innovation, standing out in comparison with traditional design practices. The Double Diamond model (or 4D model), developed by the Design Council in 2005, represents the divergent-convergent nature of the design process, which spaces from wider explorations of an issue to focused actions. The model identifies 4 phases of the design process: *Discover*, *Define*, *Develop*, and *Deliver*. During the *Discover* phase (1), designers explore new opportunities and gather insights which will be refined into a clear design brief (*Define,* 2). The *Development* phase (3) then sees the generation and testing of design solutions, using multidisciplinary collaboration. Finally, in the *Deliver* phase (4), the selected concept undergoes validation, production, and launch

(Design Council, 2024; Tschimmel, 2012). The Double Diamond stands out for its comprehensive nature: its detailed framework provides a holistic view of the design process, guiding practitioners with clarity and purpose. Another distinctive model is the Hasso Plattner model, developed by the d.school at the Hasso-Plattner Institute in Potsdam, which is a six-phase, non-linear, iterative approach to design thinking. Given a design challenge, the process begins with the *Understand* phase (1), where research and data collection shape the project's direction. The following phases include *Observe* (2), in which qualitative research methods are applied to understand user content, and *Define Point of View* (3), in which insights are synthesised to define the project's focus. Subsequently, *Ideate* (4) encourages idea generation through various creative methodologies, while *Prototype* (5) involves manifesting ideas in physical forms for testing and communication. Finally, *Test* (6) involves iterative testing of prototypes with users to gather feedback and refine solutions, facilitating continuous improvement (Hasso-Plattner-Institut, n.d.). The model stands out for its clarity and iterative nature, allowing for a straightforward and flexible design process. Additionally, the acknowledgement of user needs and user perspectives unveils its human-centred stamp. Similarly, the Stanford model is a human-centred model which focuses on understanding user needs and creating innovative solutions. It comprises five key steps: *Empathize*, *Define*, *Ideate*, *Prototype*, and *Test*. The first step, *Empathize* (1), involves immersing oneself in the user experience to gain a deep understanding of users' needs and motivations. *Define* (2) centres on crafting a clear problem statement based on empathy findings. *Ideate* (3) encourages generating a wide range of creative solutions, pushing beyond obvious ideas. *Prototype* (4) entails creating low-resolution artefacts to quickly test and refine ideas. *Test* (5) involves gathering feedback from users to iteratively improve prototypes and solutions (Hasso Plattner Institute for Design at Hasso Plattner Institute of Design at Stanford, n.d.). The model acknowledges flexibility in its application and encourages practitioners to adapt it to their own style and projects. Additionally, prioritising empathy, creativity, and iterative improvement, the model may foster a "designerly mindset" (Hasso Plattner Institute for Design at Hasso Plattner Institute of Design at Stanford, n.d.). The aforementioned models offer fundamental trajectories and useful insights to guide design practices. Considering that such frameworks do not belong to a specific design field, they can potentially be adapted to game design processes, although they do not consider their specific features.

Concerning discipline-specific frameworks, scientific literature offers multiple insights on game design methods and approaches. A meaningful contribution to game design research can be found in Salen and Zimmerman's (2004) work, which aims at bridging the distance between theoretical and

practical aspects of game design, proposing a unifying framework for all types of games (both analog and digital) and providing guidelines for designers and researchers. The authors, acknowledging the unpredictability of gameplay dynamics, outline an iterative design model based on a cyclic process of *prototyping*, *playtesting*, *evaluating* and *refining* a work in progress. The authors offer a framework that, focusing on the importance of iterative design, considers the game designer as an *active player* and the act of play as an act of design. Particularly, the act of play is the only means through which the game design product can be assessed in its features and consequently refined. Following this same direction, Fullerton (2008) presents a playcentric four-step iterative design methodology, consisting of *Generate Ideas*, *Formalise Ideas*, *Test Ideas* and *Evaluate Results*. The author underlines the importance of involving the player in the design process "from conception to completion" (p.10). In this sense, the first step to orient the creative process consists in setting specific player experience goals, which go beyond the static game features. Alongside player experience goals, prototyping and playtesting represent key components since the earliest stages of the product. The author also includes designer's perspectives, who share ideas, advice and personal experiences with reference to specific topics covered by the book. Salen and Zimmerman's (2004) and Fullerton's (2008) works propose concepts, practical tools and strategies to put game design theory into practice with a thoughtful and comprehensive look. Both contributions constitute significant primers for the emerging field of game design theory, providing clear frameworks with an academic approach.

Although these works represent undeniable milestones for game design knowledge, research on this topic has been focusing on best practices prescriptions (e.g., *how games should be designed*) rather than the everyday reality of its practices (e.g., *how games are actually designed*), which remains mostly ambivalent (Martin, 2018). Berg Marklund et al.'s review of empirical studies that explore game development (2019) underlines the complexity of this research field, highlighting the diversity of praxis, languages and experiences identified in the reviewed studies. In this composite scenario, the authors identify common themes related to game design practices. In the first place, the widespread idea of flexibility in the game development process is often associated with an actual "lack of planning" (p.194) that impedes the adoption of standardised practices. As a result, designers would implement horizontal processes, creative autonomy and informal communication as coping strategies to manage such fluidity. Moreover, the authors question the validity and fruitfulness of subjectiveness, flexibility and autonomous work as coordinates for game design. In this sense, they question whether such practices exist only on the basis of tradition (i.e., *unselfconscious design*), raising the need to deepen the understanding of game design approaches between theory and practice.

2 Method

This study implemented an interview-based qualitative approach. A team of researchers conducted semi-structured interviews with game design industry professionals and analysed their narrations through the application of Grounded Theory methodology. The team consisted of two experts in human factors and two researchers with a background in design studies, responsible for preparing and conducting the interview as well as collecting and interpreting data.

Grounded Theory is an explorative and interpretative qualitative research method that aims at generating new theories or hypotheses founded on data rather than testing existing ones (Charmaz, 2014; De Smet et al., 2019; Strauss & Corbin, 1990). The essence of Grounded Theory lies in the discovery, development, and provisional verification through meticulous data collection and analysis, allowing theories to emerge organically from the study of a particular phenomenon (Hull, 2013). Moving from description to theory involves two key aspects: coding data and hierarchically organising concepts (Strauss & Corbin, 1990). This paper adopts the three-step coding process presented by Corbin and Strauss (2015), consisting in *open*, *axial* and *selective coding*. After grouping similar data under common conceptual labels (*open coding*), concepts are hierarchically organised or selectively coded according to themes (*axial coding*), leading to the induction of theory based on statements of relationships between these concepts (*selective coding*) (Hull, 2013; Wong, 2010).

2.1 Settings

After identifying and formulating the research problem, the first step consisted in data collection through semi-structured interviews. The team opted for this solution to elicit open responses by interviewees while focusing the conversation on particular aspects (Hull, 2013). The submitted interview model consists of 15 questions, arranged into three parts: one to collect individuals' information and two to answer the Research Question (RQ). *Appendix 1* illustrates the questions that were posed for each section, alongside additional follow−up questions. Both types of questions were predetermined. All interviews were video recorded to facilitate scripting and coding, combining videotaping with note taking, as proposed by Robson (2002). Two researchers at a time conducted the interview: while one focused on the interview content (e.g., verbal prompts, management of time, follow-up questions), the other took handwritten annotations. According to well-known protocols reported in Kallio et al. (2016), both guides introduced themselves, the scope of the research and then started with submitting the questions.

2.2 Sample

After contacting 40 game designers by email, 11 of them were recruited as voluntary participants for the study. The sample consists of 8 men and 3 women ranging in age from 20 to 50 years. Nearly half of the participants obtained a Professional Degree on disciplines marginally correlated to game design (i.e., Digital Art, Concept Art or 3D Modelling), while the other half either obtained a Master's Degree or High school diploma. The study recruited participants who professionally take part in the game design process in multiple ways according to their role, offering insights based on their specific competences. Table 1 provides an overview of each participant's demographic and profession-related information. Each participant was assigned a code consisting of the letter P followed by a number based on the order with which the interviews were carried out.

A database including participants' data was created to store information that would support the data analysis. Collected data would also include developed game design projects and professional context (e.g., company affiliation) in view of further studies with deeper levels of detail. Accordingly, an information sheet was created for each interviewee to summarise such information and contextualise the qualitative research, presenting demographic information as well as video games that they developed individually or as part of a team. An example is presented in Figure 1.

2.3 Data collection & coding process

Out of the 11 participants, only one expressed a preference for conducting the interview in written form, while the remaining agreed to take video interviews. The video interviews were conducted via Google Meet[2] application, while the written one was conducted via Google Form[3] application. The team provided participants with a release form to indicate consent for the recording. The interviews were then transcribed to text. Through a Grounded Theory three-stage coding process (Corbin & Strauss, 2015), the research team analysed the transcripts and the written interview using MAXQDA[4] software to support the operation and directly link codes to the texts. Each member of the research team accurately read the interviewees' responses, identifying and assigning labels to relevant parts related to the Research Question (*open coding*). The members of the research team thematically connected and, where needed, rephrased the obtained open codes (Figure 2). The resulting categories were discussed and defined until consensus among researchers was reached (*axial coding*).

In the final phase, the researchers conducted a review of all the categories and codes identified to determine which one would best represent the core aspect of the studied phenomenon (*selective coding*). Once the core category was identified, the team members refined its conceptual boundaries and characteristics

Table 1 Participants overview

Code	*Country*	*Gender (M/F)*	*Age*	*Education*	*Years of experience*	*Role*	*Affiliation*	*Interview format*
P1	Italy	M	25–30	Professional degree	3	Business development manager	Studio 1	Oral
P2	Italy	M	30–35	Master's degree	10	Art director	Studio 1	Oral
P3	Italy	M	35–40	High school diploma	13	Lead game designer	Studio 2	Oral
P4	Italy	M	45–50	Professional degree	24	Project manager and art director	Studio 2	Oral
P5	Italy	M	25–30	Master's degree	6	UX/UI designer	Studio 2	Oral
P6	Bulgaria	M	30–35	Professional degree	12	Senior UX game designer	Studio 3	Oral
P7	Italy	F	25–30	Professional degree	3	3D Artist	Studio 4	Oral
P8	Italy	M	20–25	Professional degree	3	Animator/technical artist	Studio 4	Oral
P9	Italy	M	20–25	High school diploma	3	Project manager/Game designer	Studio 5	Oral
P10	Italy	F	30–35	Master's degree	3	Project manager/Game designer	No affiliation	Oral
P11	Italy	F	30–35	Master's degree	3	Game designer	Studio 6	Written

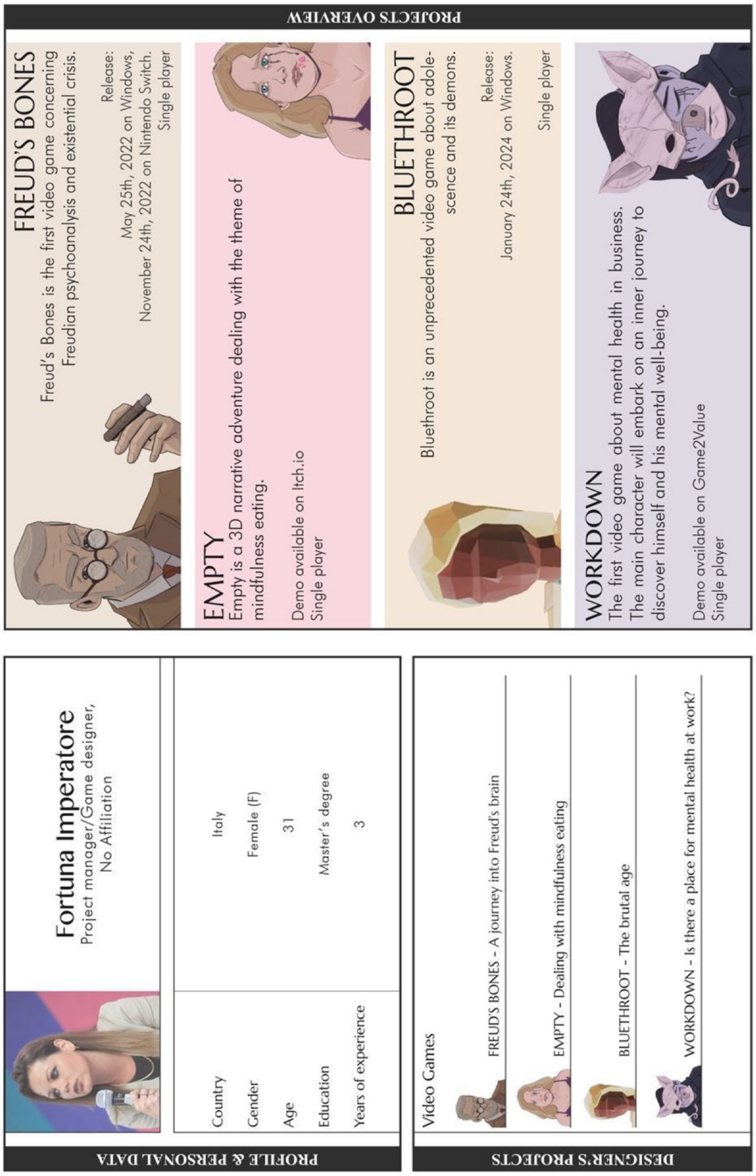

Figure 1 Information sheet example

Figure 2 Axial coding activity by the research team

by examining its relations with other categories and codes to build a coherent theoretical framework.

3 *Conceptual model of designers' attitudes and approaches*

This section illustrates the results of the qualitative analysis of the interviews conducted with reference to the RQ. The main categories and codes identified, which are illustrated in the following sections, suggest that game designers appear to balance attitudes and praxis based on elements of fixation, and attitudes and praxis relying on flexibility. Consequently, the Grounded Theory analysis of designers' statements resulted in the core category *Balancing Permanence and Change*. The model is structured in three categories, respectively *Permanence*, *Change* and *Balance*, unfolding the three main trajectories that emerged from designers' description of their ideas and practices. While the first two categories consist in two opposite tendencies, the last category represents the path that bridges them and creates the conditions allowing for their coexistence, giving balance and cohesion to the model, as shown in Figure 3. The two ellipses represent the categories of *Permanence* and *Change*. *Permanence* has an area of influence on *Change* (short arrows) that can increase or decrease depending on the situation and the strength of the sub-categories, and vice versa. The category *Balance* results from the intersection of *Permanence* and *Change*. Each category has two interconnected sub-categories, with the *Permanence* and *Change* sub-categories mediated by the *Balance* sub-categories (long arrows).

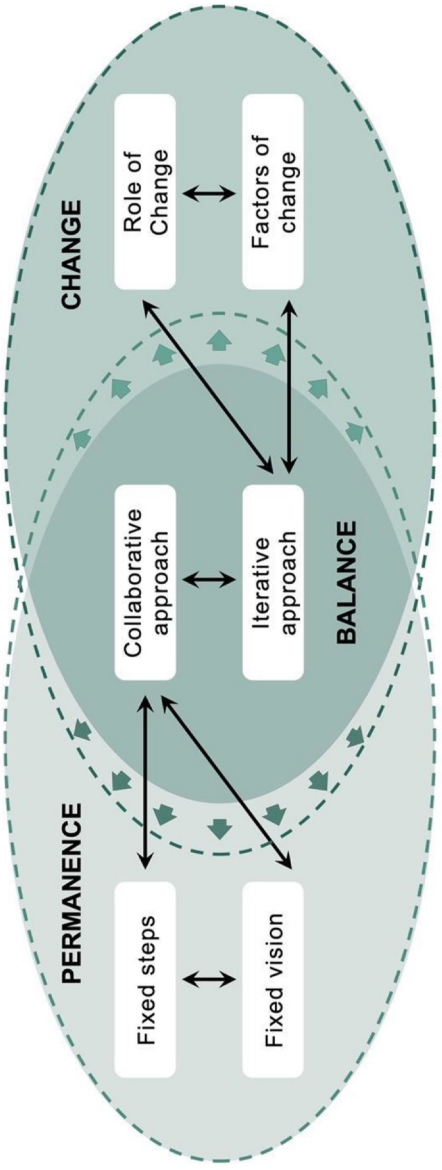

Figure 3 Conceptual model of designers' attitudes and praxis

3.1 Core category: balancing performance and change

The central dynamic that allows a cohesive understanding of designers' attitudes and practices, according to interviewees' perspective, can be defined as the creation and preservation of an equilibrium between fixed and flexible dimensions. In general, interviewees provided a narration of their professional experience stressing both the importance of building and maintaining a stability throughout the entire game design process as well as the factual need to respond to external and internal sources of change. While interviewees proved to be aware of this duality, they seem to operate the balance on a less-conscious level.

3.2 Permanence

One key aspect emerging from designers' narrative refers to their tendency to seek elements of stability throughout the game design process. Building and preserving permanence, according to interviewees, is a fundamental action to ensure the integrity and coherence of the project. *Permanence* consists of two sub-categories: *Fixed Steps* and *Fixed Vision* (See Table 2).

3.2.1 Fixed Steps

The first sub-category, *Fixed Steps*, refers to the presence of a fixed number and type of steps that the process undergoes to deliver the final product. Although being shared among all interviewees, the order of such steps slightly varied for some of them. Five codes were identified inside the sub-category. Firstly, designers referred to the need for a pre-design phase that would allow them to conceive the game design idea (*Conceiving and defining a concept*, n = 9) and assess its feasibility with reference to internal and external resources (*Analysing feasibility of the project*, n = 11). After a pre-design phase, the activity *Planning the game development* (n = 7) would produce as output a guiding tool for the creative design process, mainly identified in the Game Design Document. The two remaining steps are *Designing and prototyping* (n = 9) and *Testing* (n = 9) which hint at an iterative nature of game design that will be analysed throughout the following sections.

3.2.2 Fixed Vision

The second aspect of *Permanence*, *Fixed Vision*, referred to the overall vision of key aspects and features of the final product. Two main codes embodied this perspective. Interviewees underlined how the initial phases of the game design process should focus on creating and sharing an overall view of the game design project to guarantee a cohesive development of each single aspect and element of the game (*Starting from an overall view to progressively define smaller parts of the game*, n = 8). Additionally, this idea was reinforced by the interviewees' shared acknowledgment of the issues and criticalities connected to the opposite approach, which would consist in putting an initial focus on

Table 2 Permanence

Sub-category	*Code*	*Sub-code*	*Sentences*	*number of participants*[6]	*code incidence*[7]
Fixed Steps	Pre-design	Conceiving and defining a concept	"Through a brainstorming among team members, […] design ideas are shared for a single project" (P9)	9	82%
		Analysing feasibility of the project	"First step is always research: have others done that? Is there something similar made outside the game industry?" (P6)	11	100%
	Planning the game development		"[…] a pre-production phase, in which the whole work is organised: we define the concept art, we decide what type of game we want" (P1)	7	64%
	Designing and prototyping		"Anyone involved can have an idea for a game and they can get people to start working on prototypes […] in order to see whether that idea really translates into a fun experience" (P6)	9	82%
	Testing		"I have completed this mechanic, now I have to send it to playtesters and see if they understand it, if they do what I want them to do as a designer" (P8)	9	82%
Fixed Vision	Starting from an overall view to progressively define smaller parts of the game		"You start from […] the hooks. The hook is what you need to sell the game. So, […] you need to start from there to build the fundamental aspects that embody it […]. Then you progressively proceed to work on the smaller parts" (P8)	8	73%
	Focusing of details first is counterproductive		"Focusing on the detail is what often jeopardises the project […], initially you surely must think with a wider view". (P1)	7	64%

Table 3 Change

Sub-category	*Code*	*Sub-code*	*Sentences*	*% of participants*	*code incidence*
Role of Change	Considering that game design practices vary through time, among teams and among different approaches		"Another aspect is that each team works differently. For instance, our internal process changed through the years" (P9)	7	64%
	Highlighting the importance of flexibility of the game design process		"You never start from a fixed idea. If the solution does not work, you figure out something else" (P8)	4	36%
	Seeing challenges of game design as opportunities		"Not only design is easier when you have limitations, but in my opinion is also much more constructive" (P9)	11	100%
Factors of Change	Market		"[…] things can change, the game might take too long to make, and people have moved on. When *Fortnite* came out, games like that after it were too late […]. The market was already saturated." (P6)	7	64%
	Budget		"There are always limits […]: there will never be enough money […] and that is where lies the designers' ability, to make the most out of that mix of resources" (P2)	9	82%
	Time		"[…] maybe you can't make the characters speak to each other because you don't have time to develop that" (P8)	8	73%
	Stakeholders' requests		"[…] also client's requests, that are often different from your vision. Especially in the initial phases." (P9)	4	36%
	Team composition		"It occurred to us to scrap two projects […] the second one was not feasible for only two people to make." (P8)	5	45%

specific details without possessing a bigger picture (*Focusing on detail first is counterproductive*, n = 7). In other words, the focus on specific details should always be anticipated by the establishment of a global view to safeguard the project's coherence (i.e., the forest's idiom[5]).

3.3 Change

The second main dimension emerging from designers' narrative, in opposition to the first category, refers to designers' conceptualisation and inclination towards flexibility and variability as relevant aspects of game design. The interviewees acknowledged that change is an inevitable dimension of game design. Their attitude towards it and the internal and external factors associated with it are illustrated respectively in the sub-categories *Role of Change* and *Factors of Change* (See Table 3).

3.3.1 Role of Change

The sub-category *Role of Change* includes designers' reflections on the value of flexibility for the whole game design process. Firstly, all designers agree upon the fact that change in game design approaches is intrinsic and, therefore, has to be embraced to understand its potential. In this sense, the code *Considering that game design practices vary through time, among teams and among different approaches* (n = 7) reflects their perspective on the variability of its embodiment in fixed practices, recognising how the validity of game design approaches must always be referred to the specific context in which they are adopted. Furthermore, change is seen as a fundamental dimension of the game design process, considering how flexibility allows for a greater responsiveness of the project to different stimuli and factors of influence (*Highlighting the importance of flexibility of the game design process*, n = 4). Concurrently, designers shared a positive vision regarding change, considering it a primary source to optimise the final product, stimulate creativity and foster team cohesion (*Seeing challenges of game design as opportunities*, n = 11).

3.3.2 Factors of change

Interviewees mentioned multiple factors that can generate change, leading to the identification of five codes. A first source of change is linked to the game market (*Market*, n = 7): the extended timeframe in which a digital game is conceived and developed exposes the project to market changes in terms of trends and newly released games. Such aspects could affect the process and require drastic changes in the game's features to be appealing and valuable once released. Economic resources (*Budget*, n = 9) and time resources (*Time*, n = 8) resulted to have the most impactful role among the factors of change. Budget for design and development may vary throughout time, while the time needed to develop specific parts of the game can exceed with respect to the initial schedule. Even if planning is an essential practice to contain these factors' potential influence, they cannot be fully controlled. *Stakeholders'*

requests (n = 4) and *Team composition* (n = 5) were the last two factors of change mentioned by the interviewees. Designers underlined how the negotiation with stakeholders (clients or audience) is an important part of the game design process. The number of professionals involved in the development of the game, as well as their competencies, can also be decisive for the game development. Indeed, the choice of graphic style, the timings, and the entity of the project all depend on quantitative and qualitative aspects concerning the team.

3.4 Balance

The third and last dimension that emerged from the analysis of interviewees' discourse appears as a dialectic synthesis between *Permanence* and *Change*. This resulted in the approaches and strategies that designers adopt to ensure a *Balance* between the maintenance of fixed frameworks and core aspects and the flexibility needed to respond to factors of change. Consequently, the sub-category *Collaborative Approach* describes the first strategy that designers use, relying on team communication and cooperation. On the other hand, the sub-category *Iterative Approach* illustrates how designers are willing to repeatedly evaluate and refine design ideas and solutions (See Table 4).

Table 4 Balance

Sub-category	*Code*	*Sub-code*	*Sentences*	*% of participants*	*code incidence*
Collaborative Approach	Importance of team communication		"People need to work together: games are not a one man show. It is really about the interactions and communications between people." (P6)	6	55%
	Importance of combining individual talents		"It is a matter of finding a balance together, in which everyone is capable of expressing their own creativity." (P1)	5	45%
	Sharing and preserving an overall view of the game		"We have a diverse team that still works in close contact in each phase of the work. […] everyone has to know how every aspect of the project will be developed and from who." (P11)	8	73%
Iterative Approach	Assessing design ideas		"What we want is a quick realistic feedback on our creative ideas." (P3)	8	73%
	Avoiding tunnel vision effects		"Each person tends to refine their field of work for love and for passion […] to the point of losing the overall view of the project […] it is a risk because it might create incoherence in the product." (P1)	4	36%

3.4.1 Collaborative Approach

The sub-category *Collaborative Approach* reflects designers' tendency to underline the value of teamwork in the design and development of digital games. Specifically, the code *Importance of team communication* (n = 6) encompasses interviewees' focus on the need to ensure the efficacy of communication among team members, allowing them to mutually share ideas and information to successfully support the design process. Interviewees also stated how essential it is to guarantee and protect each member's freedom of artistic expression (*Importance of combining individual talents*, n = 5) while maintaining a shared trajectory that each designer must follow (*Sharing and preserving an overall view of the game*, n = 8). This helps to prevent individual initiatives from fragmenting the project and causing it to lose the overall vision it started with.

3.5 Iterative Approach

The sub-category *Iterative Approach* supports the explanation of interviewees' attitudes towards design problems throughout the game development. The majority of designers underlined how each design idea and solution has to be tested right after being conceptualised, in order to assess its feasibility and sustainability in light of the overall project (*Assessing design ideas*, n = 8). The need to assess design ideas through an iterative approach also responds to the risks connected to tunnel vision effects. Some interviewees showed concern about team members becoming overly focused on their area of interest, to the point that their commitment to an idea causes them to lose contact with the feasibility of their work (*Avoiding tunnel vision effects*, n = 4).

4 Discussion

The developed framework, *Balancing Permanence and Change*, illustrates the reciprocal relationships between stability, flexibility and balance strategies, underlining the approaches and relevant aspects that come to light in the everyday practice of game design. As previously mentioned, the dynamic model relies on the tension between *Permanence* and *Change*, which is held together throughout *Balance*. The presented scenario partially resembles the outline of other prominent design frameworks (Brown & Wyatt, 2010; Hasso-Plattner-Institut, n.d.; Hasso Plattner Institute for Design at Hasso Plattner Institute of Design at Stanford, n.d.). Among these, the dynamics presented in the Double Diamond model (Design Council, 2024) appear to be the closest to those emerging from our findings. Indeed, interviewees underlined the identification of reciprocal relationships, overlapping dimensions and iterative nature of the game design process. Specific aspects of our findings will be discussed in the following sections.

4.1 Permanence in game design models

The analysis of the interviews revealed that designers tend to preserve elements of *Permanence* throughout the game design process. This inclination reflects an effort to establish stability through two tendencies: adherence to *Fixed Steps* and to a *Fixed Vision*.

The first dimension, *Fixed Steps*, underlines the unanimous recognition of a fixed sequence and typology of steps constituting the methodological framework of game design process. The game designers consulted in this study follow a series of steps that are part of an iterative model. Specifically, these steps include: 1) pre-design phase (i.e., concept definition and feasibility analysis); 2) game development planning phase; 3) design and prototyping phase; 4) testing phase. These results partially mirror the phases identified by Salen and Zimmerman's (2004) model, as interviewees mentioned the presence of two additional preliminary phases to be considered in the process: the analysis of the feasibility of the project through market research and the planning of the project's development through a documentation phase. Accordingly, the game design process appears to equally lean towards pre-design phases (i.e research and idea generation) and post-design phases (i.e. testing and refinement). In this sense, the underlined steps almost match those reported in the Fullerton's proposal (2008) (e.g., *Generate Ideas*, *Formalise Ideas*, *Test Ideas* and *Evaluate Results*), although the evaluation phase was not made explicit by participants, as it was intended to be part of the last step, i.e. testing. The process described by the interviewees is centred around the users from the research phase − where users' preferences are considered − to the design and testing phases− where users' needs are addressed (e.g., accessibility features). This approach appears to echo user-centred design frameworks (Hasso-Plattner-Institut, n.d.; Hasso Plattner Institute for Design at Hasso Plattner Institute of Design at Stanford, n.d.; Kembel, 2009), acknowledging users' needs and perspective and implicitly prioritising empathy. With reference to the documentation phase, our findings support the importance that scientific literature recognises it (Almeida & da Silva, 2013; Neil, 2012; Neves & Zagalo, 2021). In particular, interviewees highlighted how the Game Design Document (GDD) is one of the most common tools for documentation in game design, as it captures the designers' vision and acts as a guiding force throughout the development process (Almeida & da Silva, 2013) detailing game elements (Neil, 2012) and supporting the prototyping phase (Almeida & da Silva, 2013). Although research identified limitations of this tool (Dormans, 2012; Keith, 2010), interviewees did not mention any particular criticalities concerning it. In general, although the order of the steps may vary, the nature of these steps remain shared among designers, elucidating a common understanding of the process's foundational structure.

The *Fixed Vision* dimension illustrates the designers' conceptual and practical commitment to maintaining a consistent vision throughout the design process. Designers often describe their practice as problem *framing* rather than problem *solving* (Schön, 1983), during which they create and share an *overarching view* of the game design project in its initial phases. Specifically, *framing* would refer to the process of identifying and structuring a problem to reach a design solution (Dorst, 2011). Such a concept appears to mirror our interviewees' narrations, since it considers how the solution is found on an upper design level, rather than being detail-based. In this sense, one might consider Larsen's (2018) distinction between vertical and horizontal design, in which "the latter is preoccupied with system details while the first is concerned with player experience and designing games in their entirety" (p. 243). According to our findings, the vertical level would take priority over the horizontal level in game design, since core elements of the game are identified earlier in the iterative process, as illustrated in Fullerton (2008), moving from early visions to detailed specifications. With reference to core aspects of framing, respondents mentioned elements that could be resembling Church's (1999) three main dimensions of game design, Bjork et al. 's (2003) Game Design Patterns or Hunicke et al. 's (2004) MDA model, positioning these elements in a vertical design perspective. In essence, elements like story, main dynamics and mechanics, as well as the player's overall experience, would be considered in the framing activity. As permanence is embodied in fixed structures that appear to orient game design approaches and practices, there are other dimensions that play an equally impactful role, as presented in the following paragraphs.

4.2 Change and flexibility models

The interviewees deemed flexibility a crucial aspect of game design, as it is necessary to cope with change and to ensure the potential adaptability of the design process. Embracing change as an inherent facet of game design, designers articulated their reflections on its *role* and the *factors* that happen to generate it.

The identification of factors contributing to change revealed a multifaceted landscape. Market dynamics, marked by trends and the release of new games, are a powerful force that shapes game design trajectories. Economic and time resources, recognised as crucial, underline the delicate balance designers must strike in the midst of varying budgets and unpredictable time constraints. The negotiation with clients and the dynamics taking place within the development team also play an influence on the course the game designs development. Interviewees affirmed how managing creativity and efficient workflows throughout the entire game development process can be highly challenging.

In general, the variety of factors that were mentioned includes soft requirements (e.g., player experience), the growth of the game company, and constraints of different nature (e.g., thematic or temporal). Several authors carried out research on such factors (Karlsson et al., 2022; Kultima et al., 2016; Tseng et al., 2008). Specifically, literature on this topic confirms how soft requirements can complicate an accurate planning of game projects, while the growth of the game company can interfere with flexibility and creative freedom in the development process (Karlsson et al., 2022). Additionally, thematic or temporal constraints can influence the generation of ideas in open-ended design problems and potentially lead to increased solution novelty (Kultima et al., 2016; Tseng et al., 2008).

Designers underscore the need to adapt game design approaches, emphasising the variability embedded in fixed practices and the contextual nature of their validity (*Role of Change*). This adaptability is seen not merely as a response to change, but as a fundamental attribute that enhances the project responsiveness to diverse stimuli and influences, stimulates creativity and fosters team cohesion. In this context, one might distinguish between two types of variables: "variables relating to stimuli that are presented to the participants (such as the novelty and the quantity of the stimuli)" and "variables relating to the design process (such as the characteristics of the participants, the size of the group and time available)" (Vasconcelos & Crilly, 2016, p. 4). With reference to the latter, temporal dynamics can improve the quantity and novelty of solutions generated (Tseng et al., 2008). Thematic constraints can also positively impact the game design process, as they can foster focus, quicker decision-making, and ultimately contribute to the creation of innovative games (Kultima et al., 2016). Consequently, constraints can be often perceived by designers not as restrictions but as catalysts that motivate them, as the interviewees' words seem to confirm. The acknowledgment of variability and unpredictability of requirements as inherent traits of game design approaches was also evidenced by Berg Marklund et al. (2019). However, in contrast to the authors' reviewed papers' results, flexibility was not considered as a euphemism for a lack of process, and was not considered by game designers as the only *fil rouge* in their work. Rather than being "so strong as to be a self-fulfilling prophecy" (p.194), the concept of variability appears to be embedded in a more complex network of needs and dynamics, which finds its own equilibrium.

4.3 Balance in collaborative and iterative models

The investigation of designers' approaches and strategies concerning the delicate balance between permanence and change in digital game

development has revealed a pivotal third dimension: *Balance*. This dimension represents a synthesis resulting from the inherent opposition between the first two dimensions, *Permanence* and *Change*. Indeed, according to Cohendet and Simon (2016), the mere presence of fixity is not enough when developing a digital game, and it needs to be balanced with flexibility to promote creativity. This vision corroborates the interviewees' acknowledgement of the co-presence of both fixed and variable elements within their design processes. To achieve this critical equilibrium, designers adopt two main strategies: the collaborative approach and the iterative approach.

The collaborative approach elucidates designers' emphasis on efficient communication and cooperation among team members. Different perspectives open up when discussing the two explanatory nuances of the collaborative approach, the *Importance of team communication* and the *Importance of combining individual talents,* emerged from interviewees' words. Berg Marklund et al. (2019) provide useful insights regarding the creative collaborative process in game design by relating it to documentation. Specifically, they show that teams prioritise frequent and open knowledge-sharing and continuous informal dialogue as the most effective ways to maintain a collaborative creative vision during the development process. Interviewees underlined how interactions among team members can be crucial in achieving an effective collaboration. Learning from shared experiences, communicating frequently, and sharing a common conceptual model of the final product seem to enable designers to cultivate empathy among team members for different disciplinary approaches (Tran & Biddle, 2008).

The second key aspect of *Balance* lies in the iterative approach adopted by the interviewees, which is one of the common foundations of game design work, along with design documentation and game analysis (Neves & Zagalo, 2021). This method, borrowed from the agile software development approach, refers to the process of repeating a set of steps or actions in a cyclical manner, often with the goal of making incremental improvements or refinements (Fagarasan et al., 2021; Kortmann & Harteveld, 2009). Shifting to the context of game design, the iterative approach allows for ongoing refinement and improvement of a game based on feedback and insights gained from each cycle of testing and analysis It is essential indeed to address issues, improve fundamental game aspects (e.g., gameplay mechanics), and ultimately create a more engaging final product (Fullerton, 2008). According to Salen and Zimmerman (2004), iteration is crucial for game designers, since the unpredictability of gameplay dynamics makes it impossible to gauge the success of a game solely through design documents

or rigid rules. Instead, the iterative design process transforms game designers into an *active player*, allowing them to critically assess the game performances, and identify areas that may hinder player engagement. The insights from Fullerton (2008), and Salen and Zimmerman (2004) appear to reflect the interviewees' perspectives on design problems throughout game development: the need for testing immediately after conceptualising design ideas appears fundamental to evaluate feasibility within the overall project. Furthermore, these studies support the idea that adopting an iterative approach enables designers to avoid the tunnel vision effect, a condition in which team members become overly focused on their specific areas of interest. As reported by interviewees, tunnel vision can indeed potentially hinder collaboration and lead to a loss of perspective on the viability of the overall project.

5 *Conclusions*

The scope of this study was to investigate designers' attitudes and praxis in game design, with reference to possible shared and recognised approaches and practices (RQ). To achieve this purpose, the study consisted of a qualitative investigation of semi-structured interviews conducted with game design professionals. The interviews were then analysed using a Grounded Theory method to extract a theoretical model (i.e., the core category) (Hull, 2013). The coding process led to the creation of a theoretical framework based on game designers' attitudes and practices. *Balancing permanence and change* was identified as the core category, revealing how game designers appear to balance elements of stability with the need for flexibility throughout the design process, adopting a variety of strategies to ensure the coexistence of such aspects. The model is structured in *Permanence*, *Change* and *Balance* as categories. With regards to the first one, stability is a requirement connected to the game design project's integrity and coherence. Interviewees acknowledged the presence of shared steps that structure the game design process and highlighted how establishing and sharing an overall view of the game design project is fundamental to prevent a fragmented development. While the adoption of structured steps found correspondences in scientific literature, the concept of a fixed vision has been found similar to what scholars describe as *framing* (Dijksterhuis & Silvius, 2017; Dorst, 2011). With regards to the second category, *Change*, our findings show that designers consider flexibility as an inevitable factor in game design and acknowledge how it can represent an opportunity for creative reinvention. Additionally, many dimensions were identified by respondents as sources that could generate change (e.g., market, time and budget constraints).

These findings appear to confirm the connection between factors of change, constraints as challenges and opportunities for team collaboration and creativity enhancement (Kultima et al., 2016; Tseng et al., 2008). The category *Balance* encompasses the resources on which designers rely to maintain fixed frameworks and still respond to factors of change. Team communication and cooperation were found to be a central strategy to ensure both the process's coherence and flexibility (sub-category *Collaborative Approach*). On the other hand, interviewees proved iteration to be a fundamental pillar in game design, concerning the need to test and assess each design solution as well as the need to avoid tunnel vision effects. The recognition of collaboration, knowledge sharing and iteration as key factors for adaptive and successful game design processes is reflected in scientific literature (Berg Marklund et al., 2019; Tran & Biddle, 2008).

This study presents some limitations. The restricted sample size of this analysis can represent a threat for the external validity of its findings, exposing it to risks of selection bias. Still, according to literature (Clarke & Braun, 2013; Fugard & Potts, 2015), data saturation in qualitative analysis can be reached within a number of 12 participants, which is close to the number of participants of this study ($n = 11$). In addition, a big sample of participants could have compromised the efficiency of the data analysis to the scope of this preliminary research, failing to mirror the research purpose (Baker & Edwards, 2012). As 10 out of 11 participants belong to the Italian national context, the results could be relevant only in this specific cultural context. Additionally, this analysis did not take into account differences between professional backgrounds of participants. However, the study's findings proved to be echoing results of scientific literature dealing with similar topics and the present study is considered to be preliminary, as further assessment will be implemented to test the reliability of the model on a larger scale. Considering the adoption of Grounded Theory, the research findings might be biassed by the researchers' assumptions and pre-existing ideas on the analysed dimensions. Acknowledging the perspective and background of researchers, we attempted to minimise this risk by ensuring the transparency of the entire process (Stiles, 1993). Moreover, anchoring the analysis of data with its direct gathering, we attempted to avoid confirmation bias (Klayman, 1995). It is important to note that the model of balance between permanence and change developed in this study needs to be considered as an attempt to systematise the knowledge collected through the interviews, not wishing to draw deterministic and exhaustive conclusions on game designers' approaches and practices, which further limits the results of this study.

Given these limitations, the results of this analysis can still represent a meaningful step towards a deeper understanding of game design approaches and practices, reflecting a real-world setting that closely relates to designers' everyday experience and providing a theoretical and analytical tool through which game design can be investigated. Further research should expand the participants sample to assess the validity of the model or redefine it in light of new information. Specific or more diverse groups of designers could be the focus of complementing research on the topic in order to determine whether there could be significant differences based on participants' characteristics or with reference to particular cultural or professional contexts. Moreover, the adaptability of the developed framework could be assessed across different types of digital games to check for possible genre-related specificities. In conclusion, interviewees' narrations provided a practical and experiential perspective on game design, showcasing the relevance of all the presented concepts in real-world game development settings. It appears, therefore, that transposing game design principles from theory to practice can unveil new scenarios to be investigated.

CRediT authorship contribution statement

Laura Cormio: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Data curation, Conceptualization. **Catia Giaconi:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Conceptualization. **Maura Mengoni:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Conceptualization. **Tommaso Santilli:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Data curation, Conceptualization.

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Appendix 1. Interview model

Interview section	*Main questions*	*Follow-up questions**
SECTION 1	Place of birth Gender Age Education Years of experience Role Affiliation	
SECTION 2	How many design projects have you approached in your professional experience? When considering a design project, are there specific steps that you follow in your design workflow? What comes first? If so, how flexible are these steps in terms of the specificity of the project? Are these steps common to all projects? And what determines the flexibility?	Which projects have you developed?
SECTION 3	How do you frame a design case?	When framing a design case, do you adopt a narrow vision (focusing on the individual aspects you want to achieve) or do you adopt a wider vision?
	How do you deal with User Needs in your design process?	The design industry's attention shifted from UI to the wider concept of UX. Did this happen for game design as well? or has UX always been preeminent in game design, under the form of gameplay? What do you think is the relationship between UX and UI? What comes first?
	What are the primary sources of inspiration and stimuli that provide you with ideas for a project?	Do you think the design solutions adopted by other designers influence your work? Do you think the design solutions you previously adopted in your professional experience influence your work?

(*continued on next page*)

(*continued*)

Interview section	*Main questions*	*Follow-up questions* *
SECTION 4	Which software tools do you use in your work?	
	In the process of development of an idea, what influences the aesthetics, the choice of graphic style?	What influences the choice of 2D style or 3D style?
	In your opinion, what makes a game a work of art?	
	How does the working context affect the development of an idea?	
	How do external limits (such as budget, time, etc.) affect the development of an idea?	How did you overcome such limits?
	Do any ethical aspects emerge in your projects? How do you deal with the ethical dimension of video games?	
	Do you wonder how it influences its outcomes?	
SECTION 5	Do you consider users' ability when designing a game?	
	How do you conceptualise accessibility, usability and engagement? What do they mean to you and what role do they play in your design process?	
	Do you think the game industry gives enough attention to the theme of inclusion and diversity of its final users?	What do you suggest?
SECTION 6	How do you think the interaction modalities of digital games will be reshaped in the future, considering the new emerging technologies?	
	What did you learn from your professional experience?	Is there a specific story (fun, good, bad) that you would like to share from which you have learned something valuable for your profession?

* These questions were posed whenever the initial answer of the interviewee was deemed insufficient to properly cover the topic by the interviewer.

Data availability

The authors do not have permission to share data.

Notes

1. Examples can be found in https://www.gamedeveloper.com/; https://www.youtube.com/@sasquatchbgames/featured; https://www.youtube.com/@gamesindustry/videos
2. https://meet.google.com/
3. https://www.google.it/intl/it/forms/about/
4. https://www.maxqda.com/
5. The idiom "You cannot see the forest from the trees" refers to one's incapability to get a general understanding of a situation if they are overly focused on the details.
6. Numbers of participants that mentioned the content of the code.
7. Percentage of the total of participants that mentioned the content of the code. Code incidence was reported for the sake of completeness.

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