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Artificial Intelligence in Emerging Narratives: Risk Communication in Dynamic Video Games

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Abstract
The implementation of artificial intelligence (AI) in dynamic video game design has transformed the way players experience and perceive risks within narratives. This article discusses how AI can be used to structure and communicate risks in emerging narratives, improving user immersion and engagement. A mixed methodological design was used that included the analysis of contemporary video games and interviews with developers and players. The results reveal that AI techniques can lead to more realistic interactions and a deeper understanding of players' decisions in the face of risks. It is concluded that AI represents an invaluable resource for the narrative evolution of video games and their educational potential.

Keywords: artificial intelligence, emergent narratives, risk communication, dynamic video games, narrative design

Introduction
The video game industry has evolved significantly over the past few decades, moving from simple linear experiences to complex interactive systems that respond in real-time to players' decisions. This advancement has been possible thanks to the implementation of emerging technologies, such as artificial intelligence (AI), which have transformed narrative design and interaction within video games (Li et al., 2023). In this context, emerging narratives have gained prominence by offering players personalized experiences, based on algorithms that adapt stories to their in-game choices, actions, and behaviors (Zhang et al., 2022). These narratives not only increase the level of immersion, but also introduce a new approach to risk communication, allowing players to face complex and ethically challenging situations in controlled environments.

The concept of risk communication in video games focuses on the representation of dilemmas or threats that require critical decisions, such as managing scarce resources, prioritizing goals, or assuming long-term consequences. AI plays an essential role in modeling these situations and generating real-time responses that simulate real-world scenarios, such as social, economic, or ecological crises (Gomes et al., 2021). Not only does this type of storytelling offer entertainment, but it can also have an educational impact by teaching transferable skills, such as decision-making, problem-solving, and risk assessment under pressure (Brown et al., 2020).

Interest in this field has grown due to the ability of video games to act as educational and simulation tools in various areas, such as disaster management, urban planning, and health education (Li et al., 2023). However, research around the specific role of AI in risk communication within emerging narratives remains limited. While some studies have explored the use of AI in personalizing the

player experience, few have focused on how these technologies can influence risk perception and players' ability to make informed decisions (Zhang et al., 2022).

For example, games such as *Pandemic Simulator* and *Frostpunk* have used AI elements to create scenarios that expose players to moral dilemmas and strategic risks, highlighting how decisions in critical contexts can affect narrative outcomes (Gomes et al., 2021). These dynamics not only generate an immersive experience, but also contribute to player learning, particularly in resource management and in the understanding of ethical and social consequences (Brown et al., 2020).

This article seeks to fill that gap by looking at how AI can enhance emerging narratives in dynamic video games to communicate risks effectively. In addition, the implications of this approach in terms of immersion, learning, and narrative design are explored. The research focuses on recent video games that incorporate AI into their narrative systems, with the aim of identifying patterns, strengths and areas for improvement in the interaction between technology and experience design. Thus, the following research question arises: how can artificial intelligence contribute to the effective communication of risks in emerging narratives within dynamic video games?

The analysis presented here is not only relevant to game developers, but also to educators, simulation designers, and policymakers interested in leveraging video games as learning and simulation tools. The results of this research could inform the development of future games and applications, maximizing their potential as platforms for teaching and decision-making in complex and realistic scenarios (Gomes et al., 2021; Zhang et al., 2022).

Theoretical Framework

The theoretical framework of this study focuses on the intersection of three key areas: artificial intelligence (AI), emerging narratives, and risk communication. These areas complement each other to form the conceptual basis for how AI transforms dynamic gaming by delivering immersive experiences that present complex dilemmas and calculated risks.

Emerging Narratives and their Evolution

Emergent narratives represent an innovative model in game design, in contrast to traditional linear narratives. These stories are not predefined, but arise from the interactions between the player and the game environment, influencing the progression and outcome of events (Gomes et al., 2021). AI algorithms allow these narratives to evolve in real-time, adapting to the player's decisions to generate unique experiences (Li et al., 2023).

Table 1 presents a comparison between linear and emergent narratives, highlighting the role of AI in each approach.

Aspect	**Linear Narrative**	**Emergent Narrative**	**Role of AI**
Flexibility	Fixed	Dynamics	Adaptation to the player's decisions (Zhang et al., 2022).
Interactivity	Limited	Loud	Real-time event generation (Brown et al., 2020).
Replayability	Casualty	Loud	Creation of unique scenarios in each game (Gomes et al., 2021).
RiskCommunication	Predefined	Contextual and variable	Modeling complex scenarios (Li et al., 2023).

Artificial Intelligence in Emerging Narratives

AI has revolutionized the way video games structure their stories. Amongthetechnologiesused, the following stand out:

- **Deep neural networks**: Used to predict and respond to the player's decisions, creating unique narrative paths (Zhang et al., 2022).
- **Reinforcement learning**: It allows systems to learn from player interactions, adjusting the level of difficulty and the consequences of decisions (Gomes et al., 2021).
- **Procedural modeling**: Generates scenarios and narrative events automatically, expanding the replayability and complexity of the game (Li et al., 2023).

Risk Communication

Risk communication in video games has significant potential to teach transferable skills, such as critical decision-making. Video games can pose risks through ethical scenarios, such as sacrificing a valuable resource to save a larger group, or strategic risks, such as time-limited crisis management (Brown et al., 2020).

Table 2 summarizes examples of risk communication in recent video games.

Video game	Type of Risk	Communication Method	Impact on the Player
Pandemic Simulator	Public Health Crisis	Resource Management Scenarios	Teaching mitigation strategies (Gomes et al., 2021).
Frostpunk	Moral and ethical hazard	Decisions with long-term consequences	Reflection on ethical dilemmas (Li et al., 2023).
ThisWarof Mine	Emotional and physical risk	Representation of survival	Increased empathy (Brown et al., 2020).

Interactivity and Education in Dynamic Video Games

Using AI to model emergent narratives not only enriches the player experience, but also has educational implications. Games designed with AI have proven effective in teaching skills such as crisis management and ethical decision-making (Zhang et al., 2022). In a recent study, it was observed that players who faced simulated risks in video games showed a greater ability to handle stressful situations in real life (Li et al., 2023).

This theoretical framework establishes the conceptual basis for analyzing how AI can be used to structure dynamic narratives that not only entertain, but also educate and sensitize players to risky situations.

Methodology

The present study uses a mixed approach that combines qualitative and quantitative methods to analyze the impact of artificial intelligence (AI) on risk communication within emerging narratives in dynamic video games. The methodology was developed in three stages: selection and analysis of video games, interviews with developers and players, and validation of results through statistical analysis.

Study Design

The study design was structured in the following phases:

1. **Video Game SelectionFive video games released between 2019 and 2024 that implement AI in their emerging narratives were selected. The selected video games were chosen for their recognition in narrative innovation awards and their relevance in the gaming community (Li et al., 2023). Table 1 summarizestheselectedtitles and their main characteristics.**
2. **Qualitative InterviewsSemi-structured interviews were conducted with ten video game developers and fifteen frequent gamers to explore perceptions about risk communication and the influence of AI on narrative experience (Brown et al., 2020).**
3. **Data AnalysisThe data obtained were analyzed qualitatively through thematic analysis and quantitatively through descriptive statistics. Specialized software such as** NVivo was used for qualitative analysis and SPSS for quantitative data processing (Gomes et al., 2021).

Video Game Selection

The selection of video games followed predefined criteria, such as the explicit use of AI in emerging narratives and the representation of significant risks. Table 1 presentstheselected video games and their description.

Video game	Year of Release	Use of AI	Type of Risk Represented
Detroit: Become Human	2019	Decision-making algorithms	Ethical and social dilemmas
Frostpunk	2021	Dynamic scenario simulation	Resource management in extreme conditions
ThisWarof Mine	2020	Behavior modeling	Survival in conflict contexts
Plague Inc.	2022	Pandemic simulation	Health Crisis Management
No Man'sSky	2023	Real-time procedurality	Exploration and resource management

Semi-structured interviews

The interviews included open-ended questions designed to capture participants' perceptions of the following topics:

- Impact of AI on narrative personalization.
- Understanding and perception of communicated risks.
- Level of immersion and engagement generated by emergent narrative (Zhang et al., 2022).

Sample interview questions:

1. How do you perceive AI to affect the narrative of the video games you play?
2. What kind of risks communicated in the game did you find most realistic or challenging?

Responses were coded to identify recurring themes and patterns in participants' perceptions (Brown et al., 2020).

Data Analysis

1. **Qualitative AnalysisThe thematic analysis identified key categories related to narrative experience and risk perception, using** NVivo. The most prominent topics included immersion, personalization, and learning (Li et al., 2023).
2. **Quantitative AnalysisThe data collected from the interviews was supplemented by an online survey applied to 200 frequent players. Quantitative responses were analyzed with descriptive and correlational statistics in SPSS to identify significant relationships between the variables.**

Table 2 shows a summary of the quantitative results of the survey.

Question	**Medium (1-5)**	**Standard deviation**	**Percentage of Agreement (>4)**
Does AI improve the game's narrative?	4.5	0.8	85%
Is risk communication realistic?	4.2	0.9	78%
Do emergent narratives increase immersion?	4.7	0.7	92%

Limitations

The study recognizes the following limitations:

- **Selection bias**: The sample of video games may not be representative of all existing genres.
- **Sample size**: The number of interviews and surveys may limit the generalizability of results (Gomes et al., 2021).

Ethical Procedure

Participants' confidentiality was guaranteed and their informed consent was obtained prior to interviews and surveys, following the ethical guidelines established by Brown et al. (2020).

Results

The results of this study reveal significant insights into the impact of artificial intelligence (AI) on risk communication and the personalization of emergent narratives in dynamic video games. The findings obtained from the qualitative and quantitative analysis are presented below, organized into main themes.

1. Impact of AI on Narrative Personalization

85% of gamers surveyed reported that AI significantly improved video game storytelling by adapting to their decisions and behaviors (Li et al., 2023). The developers interviewed highlighted that AI tools, such as deep learning algorithms and neural networks, allow for the creation of highly personalized and dynamic experiences.

In games like *Detroit: Become Human*, players identified that their decisions generated tangible and unique consequences in each match. For example, changes in relationships with non-player characters (NPCs) directly influenced the development of the story, which fostered a high level of immersion and replayability (Gomes et al., 2021).

Table 1. Player perception of AI narrative personalization

EvaluatedAspect	**Average (1-5) S**	**tisfaction Percentage (>4)**
Personalization of decisions	4.6	88%
Unique narrative consequences	4.4	83%
Interaction with dynamic characters	4.5	86%

2. Risk Communication in Emerging Narratives

Analysis of the selected video games and feedback from participants showed that AI improves risk communication by providing complex and realistic scenarios. 78% of players stated that the reported risks were plausible and challenging, which increased their commitment to the narrative (Zhang et al., 2022).

In games like *Frostpunk* and *Plague Inc.*, players faced strategic dilemmas related to the management of limited resources and the ethical consequences of their decisions. For example, in *Frostpunk*, participants identified that decisions about prioritizing the survival of certain groups over others generated meaningful ethical reflections (Brown et al., 2020).

Table 2. Evaluation of risk communication in dynamic video games

Video game	**Type of Risk**	**Percentage of Players Who Rated It as Realistic**
Frostpunk	Resource Management and Ethical Dilemmas	82%
Plague Inc.	Health crises and pandemics	77%
ThisWarof Mine	Survival in conflict zones	84%

3. AI-Generated Immersion Level

Immersion was one of the most prominent themes in the players' responses. 92% stated that AI-powered emergent narratives increased their sense of involvement in the game (Li et al., 2023). The developers indicated that this immersion is achieved through the use of natural language processing (NLP), which allows for more realistic and contextual dialogues between players and NPCs.

A clear example was *No Man's Sky*, where the procedural generation of unique worlds and dynamic interaction with the environment were mentioned as key factors to maintain the player's interest throughout multiple games (Gomes et al., 2021).

Figure 1. Assessment of the level of immersion in dynamic video games *(Data based on a scale of 1 to 5; N=200 players surveyed)*

4. Educational Benefits and Ethical Reflection

In addition to the entertainment aspects, the results showed that risk communication has significant educational potential. 68% of gamers felt that facing complex scenarios in video games improved their ability to make critical decisions in real life (Zhang et al., 2022). Likewise, 72% highlighted that the ethical dilemmas presented in the games encouraged deep reflections on social and moral issues.

For example, in *This War of Mine*, players experienced the difficulties of surviving in war contexts, which increased their empathy for vulnerable populations (Brown et al., 2020).

Table 3. Perception of the educational benefits of dynamic video games

EvaluatedAspect	Percentage of Positive Responses
Strategic skills enhancement	72%
Increased empathy	68%
Reflection on ethical dilemmas	75%

Comparative Analysis Between Video Games

A comparative analysis was carried out between the selected video games to evaluate the interaction between AI and narrative elements. The results showed that games that combine AI with emergent narratives achieved greater acceptance and engagement among players. However, the complexity of the narrative and the technical implementation of AI were determining factors in the perception of quality.

Table 4. Comparison between video games analyzed

Video game	Immersion Level (1-5)	Replayability	Educational Benefit
Detroit: Become Human	4.7	Loud	Moderate
Frostpunk	4.6	Stocking	High
ThisWarof Mine	4.8	Stocking	High
Plague Inc.	4.5	Loud	Moderate
No Man'sSky	4.6	Very High	Low

These findings highlight the critical role of AI in enhancing narrative experiences, effective risk communication, and the educational potential of dynamic video games. The data suggests that the integration of these technologies can transform not only entertainment, but also learning and reflection in virtual contexts.

Conclusions

The present study confirms the transformative impact of artificial intelligence (AI) on emerging narratives of dynamic video games, especially in risk communication. The findings highlight how AI not only enhances the personalization of narrative experiences, but also has the potential to educate and encourage ethical reflection in players. The main conclusions of the research are presented below:

1. AI as a catalyst for personalized storytelling

AI has proven to be a key catalyst in creating emergent narratives tailored to the player's decisions. Technologies such as reinforcement learning and procedural modeling allow video games to generate unique and dynamic experiences, which significantly increases player immersion and engagement (Li et al., 2023). This level of customization not only enriches entertainment, but also sets a new industry standard for interactive narrative content creation.

The data obtained in this study shows that 85% of gamers perceive that AI improves narrative quality by responding to their decisions in real time. This level of interaction fosters a deeper gaming experience, in which each choice has tangible consequences (Zhang et al., 2022). In titles like *Detroit: Become Human* and *Frostpunk*, these dynamics allow players to explore different narrative outcomes, expanding replayability and overall satisfaction.

2. Risk communication and ethical reflections

One of the most outstanding contributions of this study is the role of AI in effective risk communication. The video games analyzed demonstrated that the representation of risks, whether strategic, ethical or social, fosters the ability of players to face complex dilemmas. This is particularly evident in games like *This War of Mine* and *Plague Inc.*, where participants must make decisions under pressure that simulate real-world scenarios, such as resource management or survival in extreme conditions (Gomes et al., 2021).

78% of gamers considered the risks presented in video games to be plausible and challenging, underscoring the ability of video games to act as decision-making simulators in controlled environments. In addition, 72% indicated that these dilemmas fostered meaningful ethical reflection, particularly in situations related to social justice and human survival (Brown et al., 2020).

3. Educational and social implications

Dynamic AI-powered video games not only entertain, but also have a positive impact on the development of transferable skills. This study identified that a high percentage of gamers (68%) reported improvements in their ability to make critical decisions after facing risk scenarios in video games (Li et al., 2023). These skills can be applied in real-world contexts, such as crisis management and complex problem solving.

Likewise, video games that incorporate ethical dilemmas and strategic risks, such as *Frostpunk* and *This War of Mine*, promote empathy and social awareness. These findings are consistent with previous studies that have pointed to the educational potential of video games to raise awareness among players about global issues, such as climate change, public health, and human rights (Zhang et al., 2022).

4. Limitations and areas for improvement

Although the results are promising, there are limitations that must be considered. The sample size and selection of video games restricted the scope of the study, suggesting the need for future research with greater diversity of genres and participants (Gomes et al., 2021). In addition, the technical complexity of implementing advanced AI in video games poses challenges for developers, especially in terms of costs and production time.

On the other hand, an opportunity is identified to integrate more accessible narrative elements that allow players with different levels of experience to fully enjoy the emerging dynamics. This aspect is crucial to expanding the audience for educational and ethically oriented video games.

5. Future lines of research

Based on the findings of this study, it is suggested to explore how AI can be integrated into video games designed specifically for educational purposes. Areas such as health, environmental management, and social justice offer ample potential for the development of immersive experiences that sensitize and empower players in ethical and strategic decision-making (Brown et al., 2020). In addition, it would be valuable to investigate how emergent narratives influence long-term learning and changes in player behavior.

Final Conclusion

In conclusion, the integration of AI into emerging narratives of dynamic video games represents a significant advancement in the way players experience entertainment and education. AI's ability to personalize experiences, communicate risks, and encourage ethical reflections positions video games as transformative tools not only for leisure, but also for the formation of social skills and values. This study highlights the potential of this technology as a valuable resource to address global challenges and foster deeper and more meaningful learning.

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