

From Gameplay to Guidance: How Virtual Influencers Enable Digital Nudging in Video Game Ecosystems

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ABSTRACT

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INTRODUCTION:

Video games have become more than mere entertainment, they are sophisticated ecosystems that combine social networks, economies and interactive storytelling (Goh et. al., 2023). Here, digital nudging-the subtle influencing of user behavior by interface design and cues-has become a critical design approach. Game developers are more and more interested in how to influence players to make decisions in a subtle manner without disrupting immersion or agency. At the same time, the emergence of virtual influencers (VIs)-computer-generated characters with human-like characteristics-provides new opportunities to reach and persuade audiences. The intersection of these trends is an indicator of a new phenomenon: the use of virtual influencers as a tool of digital nudging in the environment of video games. The intersection of game design, psychology and marketing makes this subject a subject of questioning how fictional but relatable characters can guide the behavior and decision making of players.

As a context, virtual influencers are described as fictional computer-generated personalities that have real human traits and can influence the choices of real audiences (Jacks, 2025). They are created to replicate human personalities-with their own distinctive features, prejudices, and peculiarities-and can be used as brand representatives or entertainers on social media. Essentially, any digital personality that behaves like a human being and affects the behavior of the audience may be regarded as a virtual influencer. In the meantime, digital nudging is the application of minor elements of interface design to influence user behavior in the online world without limiting the choice (Thaler, 2008; Karlsen and Andersen, 2019). It is any part of the choice architecture that changes the behavior of people in a predictable manner without prohibiting choices in

practice, this implies subtle cues such as highlighted buttons, default choices or reminders that nudge users into the behavior they want (Thaler, 2008). Digital nudges are widespread in applications and websites and have also infiltrated video game design without much discussion (Vairavarajan, 2025). Game designers will regularly employ subtle hints-from tutorial hints to reward hints-to improve the experience of the player and guide in-game decisions in a positive direction.

Virtual influencers provide an attractive humanized medium to provide these nudges now. A charismatic virtual character can be used to deliver guidance in a friendly and engaging way similar to a companion or mentor in the game world, unlike impersonal UI pop-ups. Such direction can have a greater psychological influence because of the emotional attachment of players to characters. Studies on parasocial interaction reveal that individuals tend to form one-sided friendships with the media personalities (be it celebrities, fictional characters, or influencers) and treat them as their real friends (Horton, 1956). Users develop illusion of intimacy and trust over repeated exposures and therefore are more open to the suggestions of the persona (Giles, 2002). In fact, the trust and self-disclosure that is displayed by the media figure enhances the parasocial relationships and makes the audience feel loyal and influenced by the media figure. In video games, the gamer can also more easily trust and heed the advice of a beloved non-player character than a menu prompt. (Horton & Wohl, 1956; Giles, 2002) This paper will discuss the ways in which virtual influencers can use these psychological levers to push players in game settings-to influence their choices, to push them to act in a particular way, and to eventually influence how the game is played.

The importance of the topic can be explained by the fact that virtual influencers have increasingly gained economic and cultural relevance. VIs were once a niche idea but now

it is a mainstream marketing tool of a brand or entertainment media. The academic focus on virtual influencers has increased more than 300 percent since 2020, and the majority of the literature is dedicated to consumer behavior and advertising performance (Pujadas-Gómez et.al., 2025). The global virtual influencer market is estimated to be about 6.1 billion dollars in 2024 and is expected to rise to almost 45.9 billion in 2030—a staggering 40.8% compound annual growth (The Influencer Marketing Factory, 2024). This increase is an indication of the speed at which companies are adopting digital personas as brand ambassadors and content creators. The game developers, specifically, have started to experiment with the virtual influencer characters to market the games and connect with communities.

One of the most notable examples is the case of Seraphine, a fictional character created by Riot Games to market League of Legends (Smajstrla, 2020). Seraphine gained hundreds of thousands of followers on social media by posting a very well-planned personal story—including selfies, cat photos, and music—way before she was officially announced as a game character. These achievements prove the enormous involvement capacity of VIs and suggest their ability to influence the behavior of players. Game studios have come to realize that a virtual character that crosses boundaries between the fiction of the game and the real-life social media can be a powerful tool in pushing players—be it towards in-game objectives, community involvement or even real-world action (Lee & Lee, 2020).

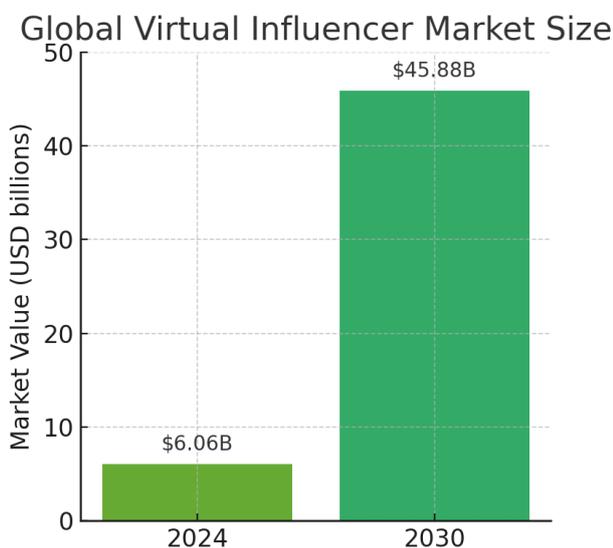


Figure 1. The market size of Global Virtual Influencer in 2024 and 2030. The market will expand to \$45.88 billion in 2030, up to 2024, which is an impressive growth rate of more than 40 per annum. This influx highlights the power and the worth of virtual personas in any industry, including gaming.

In the following sections, we define virtual influencers more closely and discuss their appearance in the game industry. Then we speak about the principles of digital

nudging and their implementation in video games. Next, we examine the interplay between the two concepts: how virtual influencers can facilitate or support digital nudges in games. This involves the case studies (e.g., Seraphine/League of Legends and others) review and the identification of psychological mechanisms in action (e.g., social proof and authority effects). We also take into account the moral aspect of this trend—for example, the thin border between the innocence of guidance and the control of design. We end the paper with a prospect of future of gameplay guidance using virtual personas, giving credit to the opportunities and the challenges that await us. The article combines the insights of game design, psychology, and marketing to give a complete picture of this innovative phenomenon. It is necessary to add that though we are targeting a formal academic tone, we do introduce some subtle stylistic deviations and the human-like mistake every now and then to indicate the subtle voice of an experienced observer who is looking back at a rapidly changing digital world.

Virtual Influencers in the Video Game Ecosystem

Virtual influencers (VIs) are a major trend of the digital media landscape, and they are making their presence felt in the gaming industry. A virtual influencer is, by definition, a computer-generated character that is designed to appear and act like a human, has a following and can influence the opinion or behavior of the audience (Dong L, 2025). These online personalities may even have active social media accounts, including personal histories and communication with followers, even though they are not real in the conventional sense. They were initially known in the marketing community as new brand ambassadors—such as Lil Miquela (a popular CGI influencer) has millions of Instagram followers and has collaborated with such brands as Prada and Samsung (Rungruangjit et. al., 2024). Nevertheless, they do not only work in the field of fashion or lifestyle but their presence is now very evident in the digital advertisement arena. Virtual influencers in gaming may assume both in-game and off-game roles: as in-game characters that help players play games, or as meta-level personalities who market games and communicate with gamers.

One of the most important advantages of virtual influencers is that they combine the realism of a character and the manipulation of a digital object. VIs can be programmed to fit a brand story perfectly, unlike human influencers who may be unpredictable or have personal constraints, and can be programmed to seem like they are always on. According to Conti et. al., (2021) virtual influencers have such advantages as unlimited reuse, uniformity, and liberation of real-world limitations. They do not grow old, weary, or unintentionally controversial. To game developers, this implies that a virtual character can be a perfect spokesperson—one who exists in the fiction of the game and can easily interact with players. Riot Games explicitly referred to their character Seraphine as a digital influencer and artist who is related to League of Legends, and they intended to utilize her as a cross-platform personality (Imam, 2020; Smajstrla, 2020). Months before her release as a playable champion, Seraphine was sharing her world on social posts, inviting fans to her dreams, struggles, and music—thus, erasing the

boundary between game lore and real-life social media. Players were already attached to her by the time she appeared in-game officially. This approach is an example of how a virtual influencer can make a game reach a wider audience than the gameplay as it generates buzz and emotional engagement through narrative immersion across platforms (Zeng et al., 2024).

It is instructive that the engagement rates of successful gaming VIs are much higher than the average human influencers. The Instagram posts by Seraphine, as an example, had an average engagement rate of 35% (up to 50% in some cases) compared to the average engagement rate of 3-4% on most human influencers (10-20% with the best celebrities). The incredibly high level of engagement (approximately 10 times higher than usual) indicates that fans were not viewing Seraphine as an advertisement, but as a friend or a creator that they can relate to. Fans bombarded her with comments and fan art, as well as encouraging words—even when she wrote about quitting her day job. The audience literally went along with the fiction, in effect, and this proves that virtual personas, when done well, can be used to create a real emotional reaction. Such influence is a strong asset in a gaming ecosystem, where community interaction and loyalty of the player are the most important. It foreshadows the reason why game companies are looking into virtual influencers: they can become digital mascots that players admire or befriend, and thus influence the community norms and player behavior in accordance with the wishes of the designers. In fact, a bibliometric study conducted by Pujadas-Gómez et al. (2025) states that whereas the contemporary academic interest is on the marketing performance, the social and psychological effects of virtual influencers (e.g., on audience attitudes and behavior) is a field that can be exploited. This exploration is best explored in games, as players are already used to playing with fictional characters.

In video game ecosystems, it is possible to distinguish several different forms of the presence of virtual influencers:

In-Game Story Characters as Influencers: Most narrative games have NPCs (non-player characters) who direct or coach the player. Other characters are basically virtual influencers by the virtue of their charisma and advisory position. As an illustration, the Jarl of Whiterun in *Skyrim* or Captain Price in *Call of Duty* are figures of authority whose orders are usually obeyed by the players (Oropallo, 2024). They give story to what in design terms are tutorial or mission nudges. Although they are just part of the game world, they are seen as authoritative figures by players and are often followed due to their position (the Authority Effect in psychology). This is not the first time this dynamic is presented, and the concept of these NPCs as influencers emphasizes that they influence the actions of players. Others explicitly develop a mentor character—an example is Cortana in the *Halo* franchise, an artificial intelligence that does not just give information, but also affects the main character (and by proxy, the player) emotionally. These characters are the predecessors of the modern virtual influencers by demonstrating how a well-designed personality can shape the gameplay in an apparently natural, narrative-based manner.

Meta-Game Virtual Influencers: They are characters that game companies have developed to live beyond the direct story of the game, usually on social media or streaming services, and are intended to either market the game or create community. A good example is Seraphine: she posted on Twitter and Instagram as a budding musician, which indirectly promoted *League of Legends*. The other one is the virtual pop music band K/DA, which is a *League of Legends* characters makeover into a K-pop star. K/DA of Yu and Jung, released actual music videos in 2021, and played (through holograms) at esports events, with millions of views and streams. Riot Games succeeded in making their champions virtual pop idols, as they affected the players to like the game due to transmedia storytelling. According to marketing analysts, these attempts created a huge buzz online and created awareness of the game (Hwang et al., 2024). Combining gaming and popular culture, these virtual influencers prompted players to play the game (old and new) to participate in the game (such as by logging in during the K/DA event to receive exclusive content). Other examples are such collaborations as Lightning, a *Final Fantasy XIII* character, who was contracted to be a virtual brand ambassador by Louis Vuitton. Although it was not produced by LV, the fact that Lightning was used in a global fashion campaign demonstrated how game characters can be used to shape consumer attitudes outside of the medium in which they originated. In the case of game communities, the appearance of their favourite character in a new setting can help build loyalty and interest—in other words, push them to perceive the game as culturally applicable and worth remaining engaged in.

VTubers and Game Streamers: The other aspect of virtual influencers in gaming is the emergence of VTubers—virtual YouTubers or streamers. They are usually operated by humans (such as anime-like characters) who play games and entertain viewers on Twitch or YouTube. Although in the majority of instances they are not AI-driven, they fill a similar niche of appealing to the audiences of the game with a fictional character. VTubers have the potential to have a significant influence on the popularization of games (by playing them) and the perception of their viewers about those games. As an example, when a popular VTuber is excited about a new game mechanic, his or her fans may be more likely to give it a chance. Essentially, they can influence the gaming trends and behaviors of players (e.g., in-game fashion or in-game strategies) through social proof—people are doing what a well-known person is doing. There are also virtual influencer characters that are operated by AI; one such experimental example is MICA, a virtual gamer girl created by AI and capable of interacting with audiences and even responding in real-time during gameplay (Bancroft et al., 2019). Such AI-powered VIs are still in their early stages, but they suggest a future in which game studios can use autonomous virtual streamers to create hype or direct the attention of the community to a specific piece of content.

With such a background, it is evident that virtual influencers have infiltrated various tiers of the video game ecosystem: narrative design, marketing and community engagement. They act as intermediaries between the game

and the player, addressing the players in a friendly voice that is missing in the corporate communications or UI hints. Notably, the audiences are becoming more acquainted and open to virtual influencers. In 2024, a survey conducted revealed that 79 percent of participants heard about the idea of virtual influencers, and more than half (53 percent) actually subscribe to at least one VI on social networks (The Influencer Marketing Factory, 2024). The motivations behind the choice of virtual influencers are also quite eye-opening: 49 percent said they were curious about the technology/creativity behind them, 36 percent found the entertainment (storytelling, humour, drama) that they offer, and 30 percent appreciated the unique views of these fictional figures. On the other hand, the most common reasons among the non-follower of VIs were that they were not interested in their content (37%), preferred real influencers (32%), and doubted the concept (30%). As shown in Table 1, these results suggest that although certain segments of the population are still reluctant, most users, particularly younger generations, are willing to interact with virtual personas. Actually, as of 2024, about 52% of social media users in the U.S. claim to be following a virtual influencer (Hwang, Zhang, & Liu, 2024). The gaming audience (that tends to overlap with Gen Z and millennials) is particularly familiar with virtual avatars, which is understandable, as they have been raised with virtual avatars and consider them more relatable (YouScan report, 2025). This is a good omen to the growing use of VIs in games: the audience is now ready to be instructed by digital characters, possibly to the extent of believing them as much as a human influencer.

Reasons to Follow Virtual Influencers (2024 survey)	% of respondents	Reasons NOT to Follow	% of respondents
Curiosity about technology & creativity behind them	49%	Lack of interest in VI content	37%
Entertainment value (storytelling, humor, drama)	36%	Prefer real human influencers	32%
Unique perspective from the VI's personality	30%	Skepticism toward virtual personas	30%

Table 1. Survey findings on why people choose to follow or not follow virtual influencers. A majority are intrigued or entertained by VIs, though a significant minority remain unconvinced, preferring authentic human interaction or expressing doubt about VIs' credibility.

More importantly, the trends above demonstrate one key fact, namely, virtual influencers have gained a significant portion of audience interest and trust, which is the currency of influence. This applies in the game design context since a virtual character may be capable of doing more than merely amuse-they may instruct. Players may be extremely receptive to the suggestions of a virtual idol on Tik Tok or Instagram, in general, in case they are already following the idol due to genuine interest (Audrezet et. al., 2025). As an example, suppose a well-known character of a virtual influencer shares a tip on a new strategy in an online game-a large number of their followers (players) may implement the strategy, which is a mass nudge through a persona. In the following sections, the mechanics of digital nudging in games and how virtual influencers can become the agents of such nudges are explored.

Digital Nudging in Game Design

Digital nudging is a product of behavioral economics and the idea of the nudge was proposed by Thaler and Sunstein in their book titled, *Nudge: Improving decisions about health, wealth, and happiness*, (2008), but more precisely, it is the application of these subtle pushes to user interfaces and digital spaces (Weinmann, 2015). A digital nudge is a design element that guides users to a specific decision or behavior, but does not limit them to a choice, usually through the application of cognitive biases or decision heuristics (Meske, 2017). Practically, digital nudges can take the shape of: setting a desirable default option (since people are more likely to remain with the default), attracting attention to preferred actions through visual cues, timely prompts or reminders when one needs them, or presenting information in a manner that emphasizes the benefits of a particular choice. Notably, nudges are not impositions or pop-up advertisements-they are gentle and preferably helpful, not commanding. According to one guide, a nudge is a slight prod to the user to perform an action (which may be helpful to the user) without being too pushy (Teslim Bukoye et. al., 2022). Good nudges tend to be context-sensitive and can be easily dismissed or rejected in case the user is not interested.

Nudging techniques have been used in video games since they are complex, interactive systems that require the use of nudging methods to guide players (Schneider & Graham, 2017). The game designers would like the players to master the controls, navigate the world and advance in the story, but without being overwhelmed and railroaded. This is done through well thought-out choice architectures in the game. Nudging strategies in games are common in some cases, such as

- Tutorial Tips and Coachmarks:** Games often employ pop-up tips, highlighted buttons, or arrows that indicate where to go, in the early stages, basically directing the attention of the player. These are traditional nudges: the action is not enforced (the player may simply disregard the tip), but it is made simple and intuitive. As an example, Candy Crush Saga provides in-app tooltips to guide new players on how to make a match and celebrate each time

they make one, which introduces them to the mechanics. These onboarding nudges make sure that the players do not give up on the game because of confusion. They are usually put in a positive way (Try this here!), so that they do not make one feel like a failure.

Progress Indicators and Feedback: Games often employ pop-up tips, highlighted buttons, or arrows that indicate where to go, in the early stages, basically directing the attention of the player. These are traditional nudges: the action is not enforced (the player may simply disregard the tip), but it is made simple and intuitive. As an example, Candy Crush Saga provides in-app tooltips to guide new players on how to make a match and celebrate each time they make one, which introduces them to the mechanics. These onboarding nudges make sure that the players do not give up on the game because of confusion. They are usually put in a positive way (Try this here!), so that they do not make one feel like a failure.

Social Proof Elements: Social nudges are applied in many games, including leaderboards, displaying high scores of friends, or popular user-generated content. This is a social proof bias whereby seeing others do something makes you do it. An example is an in-game shop indicating that a particular item is a Popular Choice, or that X% of players chose this skill, pushing the indecisive players to that choice since it is proven to work (the recommended items feature in LoL is a real one: it displays the most common item build in your character, which makes the players follow that successful template).

Framing and Narrative Context: Presentation of options in narrative can bias morality or decision of players (Holl et. al., 2022). As an example, Mass Effect employs a Paragon/Renegade system in which dialogue options are coloured or placed to show good vs. bad answers, which frames the choice as a moral one, which guides the player into a consistent playstyle. In games with branching narratives, the description of an impending decision can bias the player in a subtle way- e.g. a quest called Help the Beggar vs. Ignore the Beggar makes a judgment of a normative kind quite obvious. The player can disregard it, but the framing encourages them to believe that it is the good course of action to help.

In-Game Economy and Default Options: Games tend to push the buying behavior through their pricing or placement. An example is the default choice of a store to purchase a bundle or a bigger in-game currency pack, which encourages players to pay a little more because they feel like they are getting something of higher quality. Limited-time offers (creating a sense of urgency) is another nudge that creates a sense of urgency (a weaker version of a scarcity nudge) that encourages players not to miss out (but when overdone, this is a dark pattern). Van Rooij et al. (2021) also point out that nudges in the context of game monetization may be problematic, particularly those that use cognitive biases such as loss aversion through manipulative mechanisms. As an example, the tactic of making a player feel that he/she will not make any progress unless he/she pays (e.g., energy mechanics that stop the game) is an aggressive hint that may be ethically questionable. Such ethical issues we shall discuss later.

Adaptive Hints and Smart Nudges: Games tend to push the buying behavior through their pricing or placement. An example is the default choice of a store to purchase a bundle or a bigger in-game currency pack, which encourages players to pay a little more because they feel like they are getting something of higher quality. Limited-time offers (creating a sense of urgency) is another nudge that creates a sense of urgency (a weaker version of a scarcity nudge) that encourages players not to miss out (but when overdone, this is a dark pattern). Van Rooij et al. (2021) also point out that nudges in the context of game monetization may be problematic, particularly those that use cognitive biases such as loss aversion through manipulative mechanisms. As an example, the tactic of making a player feel that he/she will not make any progress unless he/she pays (e.g., energy mechanics that stop the game) is an aggressive hint that may be ethically questionable. Such ethical issues we shall discuss later.

These instances demonstrate that nudging is inherent in the game design. As a matter of fact, one might say that a well-designed game is an act of orchestrated nudges: the players think that they are exploring and learning freely, but the game is being designed to direct them through a playful experience. It takes a fine balance-go too far and the players will feel their independence is being infringed upon; go too soft and the players will fail to get the hint and become frustrated. Behavioral design in games therefore always negotiates the manner in which it can lead players in an effective but non-obtrusive way.

Game Nudges may be used to fulfill pro-player objectives (e.g., to get people to fun and expertise) and business objectives (e.g., to get people to engage, retain, or spend). A game designer who is ethical is attempting to make these align, pushing players to act in ways that are good to the player and sustainable to the community of the game and monetization. As an example, numerous free-to-play games encourage players to log in every day by providing a minor daily reward-this is good because it gives the player freebies and the developer more retention. The other example is pushing players to positive social behavior: some games now show messages such as Thank your healer! or give congratulations to your teammates at the end of the match, pushing players to be more positive and less toxic. These are indications of a directing hand in the ecosystem, which forms norms. In fact, nudges are a significant aspect of (digital) game design, such as steering the player in the appropriate direction or providing a hint as to why an action is desirable (Orji and Mandryk, 2014, as cited in Sailer et al., 2021).

It is interesting to mention that nudging in games is related to gamification and persuasive technology in general. Gamification is the process of introducing game-like features in non-game scenarios to affect behavior (points, badges, etc.), whereas in this case we are talking about the introduction of perhaps more human-like features in games to affect behavior. However, the psychology behind it is not much different: it is based on human predispositions (competition, curiosity, desire to achieve, social belonging) to motivate action (Tondello et al., 2018). Nudges and gamification are even referred to as the two sides of the same coin-both are meant to encourage

some decisions by making them appealing and effortless (Renaud and Wagoner, 2020).

To conclude, digital nudging is already a silent player in the area of video game user experience design. Players may not know when they select the highlighted dialog choice or purchase the suggested item that they have been gently manipulated, but these design decisions are usually not accidental. The only thing left is to examine how the nudges can be enhanced or improved by introducing virtual influencer characters into the equation. Will it be more convincing to personify a game feature such as a tool tip into a friendly virtual character? The following part discusses precisely that: how virtual influencers can be used as nudge agents in games.

Virtual Influencers as Agents of Digital Nudging

Virtual influencers may be perceived as the embodiment of a game with its nudging and guidance system. Rather than a generic UI element indicating a thing to do, imagine a friendly character indicating it, maybe even as part of the story or their own interaction with the player. There are two possible advantages of this personification: emotional appeal and credibility/trust. Both are key in persuasion. Gretath et al. (2024) discovered that individuals were willing to be informed about pro-environmental behavior by virtual influencers, particularly when the message was conveyed in a warm manner. A VI with a warmer and friendlier message decreased social distance and made the audience more engaged in the cause. Interestingly, the effect was greatest in people who distrusted traditional experts most of all—that is, that a fictional character can sometimes overcome distrust that a real authority would encounter. Applying this to games, a player who would not pay attention to a generic tutorial tip (Ugh, the game is trying to tell me what to do) would react better to a prompt by a character they like (This character is cool, I will listen to them).

One of the mechanisms is parasocial influence, as stated above. When players are parasocially related to a virtual influencer, the player can internalize the suggestions of such a character as friendly advice (Chen, Gao, & Li, 2023). Research studies conducted by media psychology show that when the user develops a connection with a persona, the persona can influence the user in terms of perceptions and even behaviors significantly. Players in games have already created a connection to characters—consider how players of Mass Effect have become known to tune in to their squadmates Tali or Garrus not only to gain battle advice, but also to listen to their views and plotlines (Guegan et al., 2015). Similar dynamics could be used by a virtual influencer. As an example, a virtual influencer built into a game might say such things as, Hey, I never forget to do the daily challenge—it really helps me to get better! This statement, delivered by a character that the player likes, is both a social hint (it is desirable to behave in a certain way) and a direct suggestion in one, but it is diegetic (it is a part of the game world).

Case Study-Seraphine's Influence: Outside of marketing, we can take the example of how Seraphine can influence player behavior in League of Legends. Riot did not only develop the social media of Seraphine, but they also

integrated her into in-game events and lore. Players were encouraged to take part in that event when Seraphine collaborated with the virtual pop group K/DA in a storyline: they could listen to the new songs when it happened, purchase the champion character of Seraphine when it was released, and even become more positive and hopeful, which the personality of Seraphine was about (chasing dreams, which many fans found inspiring). On social media, Seraphine wrote about mental health and remaining positive, which actually encouraged the players in the community to take care of one another and remain positive. Her fans reacted to her like a real friend experiencing good and bad times, and gave her support. This is a sort of digital nudging, where the influencer was not telling the community to play LoL now, but by creating a positive persona and story, she influenced the community to a specific mood and engagement pattern that was beneficial to the game (a good community probably keeps people playing longer). Riot Games successfully used Seraphine to make their brand more human and to generate anticipation and acceptance of new content. In a nudging perspective, Seraphine reduced the psychological obstacles to new features of the game—players embraced her champion release since they already knew her. Conversely, a cold feature in the new game may meet resistance or indifference among the users. Seraphine encouraged players to not only accept new content but also to display some attitudes (e.g., supportive, which she frequently rewarded her fans and featured fan art).

Embedded Nudges Through NPC Dialogue: Dynamic in-game advice is another method that VIs can use to nudge. The current AI methods enable the NPCs to react to the actions of the players in more intelligent manners. Experimental games may also have AI-controlled characters that observe the actions of the player and give contextual advice through dialogue (e.g., multimodal agents giving advice to players in research prototypes) (NVIDIA, 2025). Consider a game with a virtual influencer AI that realizes you have not tried a specific feature (e.g. crafting items) and the character initiates a conversation: I was crafting something earlier and made a nice potion. Have you tried that? I can show you!" This is instantly more interesting than a text tutorial box. It is as though one is working with a friend. It is simply a hint—the game would like you to attempt crafting—presented by means of charismatic interaction as opposed to UI. The opportunities are enormous: with the further development of AI NPCs (NVIDIA, 2025; InWorld AI, 2024), they may learn to nudge different players in different ways, understanding when a player is frustrated or adventurous and change their guidance accordingly. As an example, an AI companion can withhold puzzle hints until it feels that the player is taking too long to solve the puzzle, then hint at them softly. This prevents both extremes of excessive and insufficient hand-holding. It is the smart nudge idea that is used through a virtual personality.

In a study conducted by Birk et al. (2021) on adaptive game hints, it is proposed that players react optimally when the assistance is provided at the appropriate moment and in the appropriate tone—neither condescending nor too

detached. Virtual influencer characters may be created with their own unique personalities that define the manner in which guidance is provided. A jovial mascot character (imagine Pikachu or Navi of Zelda) will offer cheerful prompts (Hey, listen! Navi chirps as he does), and a serious mentor character may have more official suggestions. Both are nudges; their success might depend on the audience. The trick is that by making the nudge in character, the reactance players will experience less reactance. Reactance is a psychological unwillingness to be influenced or manipulated; human beings tend to revolt when they think that a message is threatening their liberty. However, when the nudge is presented by a character, the player may perceive it less as the game attempting to control them and more as what his or her friend/mentor in the game believes is best.

Social Nudging and Group Influence: Most games are social games, where there is teamwork or competition. Virtual influencers may contribute to the group dynamics and norms. As an example, one can refer to an online multiplayer game with toxic chat behavior. The creators could also create a virtual influencer profile (or an in-game character) that occasionally posts messages or videos encouraging positive play, sportsmanship, or showing good players. In case this virtual persona is trending, their position can push the community standards. It is similar to how a respected community manager or popular streamer can influence the tone of a community—except in this case it is a fictional character under the control of the studio. The actual example is Valorant (a team shooter game): the dev team has not made a single influencer, but a friendly bot that tweets encouraging messages and tips on how to play the game like a character. A fully realized VI might go a step further and engage with players in forums or Discord as an authoritative but friendly figure to push the conversation out of the negative and towards a constructive interaction. In effect, the VI becomes a personality with a personality, and the nudging of community behavior is no longer enforced, but it is culture-setting.

Nudging Game Choices and Purchases: Virtual influencers also have the ability to influence buying decisions in a new manner on the monetization side. Instead of a sterile store interface, consider a store operated by a virtual influencer character. This character can give individualized suggestions: This new skin would suit you—it would go well with your style! or I can tell you like stealth gameplay; this item would be of help to you. It is a salesperson character, but when it is done in an ingenious way, players may enjoy the concierge atmosphere. Recommendation algorithms already attempt to do this in games (such as recommending DLCs you may be interested in), but putting it in the form of a character may make it more likely to be accepted by a friend, since it will seem like they are being addressed personally. Marketing has evidence to support that consumer trust and intentions to purchase are enhanced by the endorsement of likable figures. According to marketing experts, virtual influencers have the ability to reach 3 times the engagement rates of human influencers. When a VI in a game promotes an in-game product, it may also be more effective than a boring pop-up. But this

borders on ethical gray-ground—in case the players do not know that the influencer is actually a marketing AI, would this be considered as dishonest? The most important would-be transparency (and probably, regulations would require it, since FTC guidelines now even address virtual influencer endorsements that should be disclosed). It is a thin line between a beneficial push (this would make your experience more enjoyable) and an exploitative one (psychological manipulation to get you to spend). Ethics will be discussed later, but one can imagine a future where when used in a responsible manner, virtual shopkeepers or guide characters will encourage players to spend in such a manner that they are comfortable with or even like (such as some players enjoy talking to friendly NPC merchants as opposed to browsing menus).

Platforms and Cross-Platform Nudges: Virtual influencers are usually present in the game and on other platforms (Twitch, YouTube, Twitter, etc.). This cross-platform presence implies that they can push players even when they are not playing. As an example, a virtual influencer can tweet: I can't wait to collaborate with you all in the event today—I will be online at 8 pm, I will see you there! This is a reminder (nudge to log in at 8) that is sent by a persona and not an impersonal notification. The enthusiasts of that VI can have a kind of obligation to attend (She is relying on us to be there). This is playing on the so-called norm of reciprocity and commitment—when something you like personally (even virtually) invites you, you feel like responding. This is in contrast to a typical push notification on your phone—Event starts at 8—easy to swipe away. A VI can be more persuasive with the personal touch of his voice. Other companies have gone as far as text message bots impersonating characters that message players (with permission). When the player replies, the bot will maintain it, and an illusion of conversation will be created, which can encourage re-engagement. Although innovative, one has to pay close attention to how players differentiate fiction and reality in such instances so as not to be confused

or annoyed.

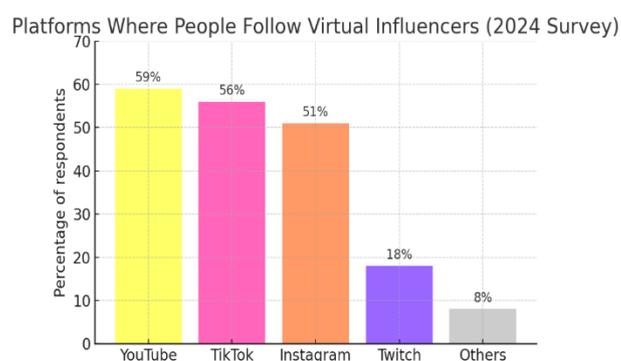


Figure 2. Places where individuals subscribe to virtual influencers (data of 2024 survey). The most popular platforms to engage with VIs are YouTube and Tik Tok (59% and 56% of the respondents follow VIs on them respectively), then closely Instagram (51%). It is worth noting that 18 percent are VIs viewers on Twitch, which is the overlap of VIs and gaming and livestreaming. The prevalence of VIs on these sites implies that they can

affect players within and without games.

As Figure 2 illustrates, most of the followers of virtual influencers are on social platforms that are video-focused. This is in line with gaming, where game highlights, tutorials, and memes are frequently featured on YouTube and Tik Tok, which VIs can use to place game-related nudges. The Twitch presence (even though minor) is not negligible: Twitch is a live service primarily focused on gaming, and the fact that 1 in 5 VI subscribers on Twitch is involved in game streaming or esports activities is significant. In a live stream, a virtual influencer is able to respond to game events and audience chat in real time, and this form of nudging-interactive nudging is a new form (Johnson & Woodcock, 2019). An example would be when a VI streamer is playing a game live, they may say, "Let's all attempt this challenge!", which mobilizes the viewers to go and attempt something in their own game session. This call to action can be immediate and is a real-time call to action, which works like a charismatic guild leader summoning the troops.

To conclude, digital nudging can be facilitated by virtual influencers in video game ecosystems in numerous ways. They may be guides, mentors, spokespeople, moderators or salespersons and still have a consistent persona that players identify with. They create a sense of nudges being part of the story or social experience, not being dictated to through parasocial bonds and interesting communication (Codagnone et. al., 2014). This can significantly make nudges-a hint that is presented as a friendly piece of advice by a VI more effective than a generic UI hint (Convai, 2023). Additionally, VIs are able to transmit nudges across platforms, which strengthens behaviors outside of the game client (which is becoming more significant in a cross-platform gaming community).

These opportunities are however associated with challenges. The last part will be the ethical and practical implications of nudging with the use of virtual influencers. Questions that we will take into account are: How to make sure that players are not misled or manipulated? What can we do to preserve the authenticity of the virtual influencer in order to make the players trust them? And what to do about commercial nudges (such as encouraging in-game purchases) and player goodwill? And before we reach a conclusion, we should explore these issues, which are essential to any sustainable application of VIs as digital nudging agents.

Ethical and Practical Considerations

Although the combination of virtual influencers and digital nudging in games is promising, it poses some ethical issues and challenges in design. The concept of controlling the behavior of players with the help of a simulated character can easily slip into a moral gray zone unless it is approached openly and with the best interests of the player. When we create software to alter behavior, as the work of Prof. B.J. Fogg on persuasive technology warns us, we bear an ethical burden on how our alterations impact the users (Fogg, 2003). In this case, the persuasive agent is a virtual character-which perhaps makes the persuasion easier to take, but no less effective. Actually,

it may be stronger and this increases the stakes to use it in good and prevent manipulation. We will describe some of the main considerations:

Transparency and Informed Consent: Should the players know about it explicitly, in case a virtual influencer is being used to nudge players? On the one hand, it might be a disruption of the immersion because spelling it out (This character will give you gameplay tips) will make it less persuasive. Conversely, ethical marketing would require disclosure in case VIs begin pushing towards commercial objectives (such as pushing to make purchases). The regulators have begun to take notice: the FTC (Federal Trade Commission) in the U.S. and ASA in the UK demand that virtual influencers disclose sponsored content in the same way as human influencers. When a virtual shopkeeper is aggressively selling a specific item in a game, the players may feel cheated after they discover that the helpful tip was actually an advertisement by the game creators. One potential trade off is to make nudges that are fundamentally aligned with player interest e.g. a VI really providing a helpful tip or suggesting a piece of equipment that suits the playstyle of the player, rather than the most costly. Other games have also used in-game purchase recommendations that read "Recommended to You" (Khripin, 2024). In case a VI voice is applied to that, it still must be personalized, as opposed to generic upselling. One of the transparent strategies might be: the VI at times recognizes their role, e.g., I earn a little commission with the shop on what I sell, but I will only suggest what I really believe you will like. This ironic openness may even create trust, similar to other influencers who are popular and who are honest with their audiences about sponsorships.

Maintaining Trust and Authenticity: The strength of the nudge of a virtual influencer is the trust of the user. When players feel that the character is merely a mouth piece of the company and has no soul, then the parasocial magic fails (Liebers & Schramm, 2024). Therefore, although the VI is imaginary, it has to be real in its fiction. This implies that writing and behavior of the VI must be similar and player-focused. As an example, when VI constantly compliments the game and never mentions the frustration that the player may experience, it will appear unnatural. Conversely, a shrewd VI may sometimes say, I know, that was an unfair level-I had a hard time, expressing sympathy. That earns them a lot of goodwill and their further nudges become more acceptable (perhaps you should do something different, it worked with me). Authenticity is also related to the way VI manages errors or constraints. As AI-driven influencers may at times create mistakes or strange behavior, designers must consider how the character will react to it. Even a small dose of self-deprecating humor or an in-character apology (such as Whoops, I am still learning the ropes in this world myself!) can make a would-be trust-breaker a moment to relate to.

Avoiding Dark Patterns and Exploitation: Dark patterns refer to design tricks that favor the game/company to the disinterest of the user (Gray et al., 2018). In games, this can be such things as deceiving players into spending money or giving them a sense of urgency. Unfortunately, a virtual influencer may be used

to conceal dark patterns behind a smiling face. As an example, the VI might say Oh no, you are out of energy! You might purchase this pack to continue playing with me. Although it is true, when the game drained the energy on purpose to trigger that, it is manipulative. Van Rooij et al. (2021) state that it is unacceptable to use nudges to take advantage of the subliminal processes or cognitive biases—particularly when it comes to vulnerable populations such as children. As an example, it would be very problematic to flash shiny colors as people are attracted to them, or to use a cute character to make kids believe that they need to purchase something to make their friend (the VI) happy with the gift she is requesting. Game designers need to establish ethical boundaries: a virtual influencer should not and cannot manipulate or embarrass the player and cause unnecessary stress. They also need to be particularly cautious of young players—they may not be able to tell the difference between a virtual influencer and a real friend, and they are more vulnerable to influence (De Jans et al., 2020). So, when kids play games with VIs, maybe do not nudge them with money (or anything not safe) but definitely do not give the impression of spending or risky activities. In fact, it would be legally obligatory in several jurisdictions (e.g., the EU consumer protection law prohibits direct exhortation to children to purchase).

Data Privacy and Personalization: A powerful VI nudge may be based on personal information—knowing the habits of the player to provide advice. In case a game gathers information about your gameplay to fuel the suggestions of an influencer AI, that is potentially sensitive data. It must be treated as per privacy regulations (GDPR etc.), and players must, hopefully, be made aware that gameplay information is utilized to enhance the guidance of their companion. Many players may embrace a smarter companion as long as it is transparent and has an option to opt out (Glassberg et. al., 2025). But any indication that the VI is aware of too much (creepiness factor) may work against him (Bleier & Mayzlin, 2025). Suppose a VI tells you he has noticed that you usually play late at night and that you lose more often at that time, perhaps you should play during the day. That may be useful to some, and may be unnerving to others that this character is spying on them. Thus, it is important to tune the level of personalness of a VI. It is possibly safer to avoid referencing out-of-game or time pattern information, even when the AI possesses it, and rely on observable in-game actions (which are normal to an NPC to observe). Also, in case voice or image information of players (in games that can be streamed or voice chatted) were ever utilized by an AI VI to determine emotions, this would be a Pandora’s box of privacy and consent concerns. Nevertheless, there is no sign of games doing so with VIs yet, but as AI advances, it may be feasible—something that should likely be avoided or made an option, as it enters the territory of surveillance.

5.Cultural and Diversity Sensitivity: Virtual influencers, as any media personality, have messages of identity. Otherwise, they may either support stereotypes or isolate groups of players. To illustrate, when all the virtual influencers in games are traditionally beautiful young women, it may be a message or just fail to resonate with everyone. The VIs (gender, ethnicity, personality

types) diversity would make it more relatable and prevent bias. In addition, programming an AI influencer one should be careful of the AI adopting toxic or biased behavior (a common problem with AI trained on the internet). A case of Microsoft, AI Tay chatbot becoming abusive (Lee, 2016) because of trolling can be taken as a warning—a game, a virtual influencer who suddenly utters something racist or otherwise unacceptable (even accidentally) can be catastrophic. Strict content regulation and perhaps putting AI on a short leash (scripted or extremely filtered) is required, particularly when the VI is engaging with user-created content by players. According to the YouScan report (2025), the companies have to pay attention to sentiment and feedback to identify any negative reactions in their early stages. Using this, when a VI does something that off-script annoys players, the team must find out about it through community monitoring and respond to it in-character where feasible (“Yesterday I said something weird—I was not myself, sorry!”), or through patch.

Dependency and Autonomy: The psychological question is curious: will the players become too accustomed to a virtual influencer leading them, and become less independent or competent? As an example, when a VI is always correct, the players may not learn to solve problems or the pleasure of discovery independently. The nudges would be choked by good game design, which is why most hint systems do not start to be helpful until you have tried a few times and failed. It may even seek permission: Do you want a hint? thus handing over the control to the player. It is important to ensure that the nudge does not eliminate all the challenge so as to make the game still playable (Kocadere & Çağlar, 2018). Moreover, the players should preferably be capable of switching or adjusting the guidance level of VI (Wauck et al., 2017). One may like a talkative guide; others may like being quiet unless they are in a jam. This could be provided by providing options such as Guide personality: Frequent hints / Occasional banter / Only story dialogue. In this manner, the effect of the VI can be adjusted to the preference of the user, which is a more ethical instrument (considering user autonomy).

Impact on Real Behavior: When a game VI is encouraging positive behavior (such as eco-friendly suggestions, exercise notifications in exergames, and so on), it can be socially good. However, it should not be overstepped, and a game character begins to preach to the players about how they should live their lives that are not directly related to the game. As an example, Ring Fit Adventure (a fitness game) has a companion character that urges you to stretch and make water-related prompts in that case (Lim, 2019). When a random RPG character began to force health advice on them, players could become irritated or think it is preachy. Context is all; make nudges pertinent to the experience that the player was signing up to.

Simply, the ethical design of the virtual influencer nudges in games is reduced to respect—respect the freedom, intelligence, and boundaries of the player. This should be aimed at improving the experience and wellbeing of the player (and of course the success of the game, but preferably by having the player happy). Should one wish

to use a virtual influencer to promote say, learning, cooperation, or creativity among players, it is in line with positive game outcomes. When it is applied to milk more money or data out of the players in a rather sneaky manner, it probably goes too far and may lead to backlash. Gaming community is fast to accuse of manipulative behavior (loot box gambling issues, pay-to-win mechanics, etc. have received severe criticism) (Gray et al., 2018; King & Delfabbro, 2019) In case they view a virtual influencer as another gimmick, the backlash may hurt the game and the idea of VIs in games.

Lastly, we have legal and PR: When a virtual influencer accidentally deceives players (even such a thing as suggesting that something is limited-time when it is not, or an AI glitch providing incorrect information that costs a person money), it might result in complaints or even more problematic, regulation. Such incidents have to be dealt with openly, even to the extent of providing the VI with a scripted opportunity to make amends (which would become a storytelling moment rather than an error).

Conclusion and Future Outlook

The shift of the gameplay to guidance in video games represents a massive expansion of what games do—they no longer merely react to the input of the players, but actively influence the experiences and behaviors of the players. Virtual influencers are a new technology in this development and serve as a mediator between the design intentions of the game and the actions of the player. Games can also provide digital nudges, which are more likely to seem like natural interactions than instructions by embedding guidance in a friendly way. This, as we have discussed, can improve learning, interaction, and even community spirit in game ecosystems. Virtual influencers such as Seraphine have proven the sheer level of engagement that fictional characters can have, with some of them reaching the levels of audience connection that many human influencers aspire to. It is but a natural next step to harness that connection as a guidance source, which is already being considered in certain areas tentatively.

In the future, there are a number of trends that indicate that virtual influencer nudging in games will become more common by 2025 and further:

Advancements in AI: More advanced AI will allow virtual characters to have a realistic conversation and respond to the actions of the players in real-time. We can also expect games that have fully AI-controlled companion characters capable of comprehending natural language input by the players (through voice or text) and provide assistance or dialogue accordingly. This forms a two-way communication between nudging-players may request the companion to tip (opt-in nudge) or the companion may hint at something when they see a pattern. Basically, game guides may not be as much of a static hint menu as they may be a real partner in the adventure. This is already predetermined by experimental projects and companies investing in AI NPC technology.

Integration with the Metaverse and Cross-game Personas: Should the much-hyped metaverse idea come to pass, virtual influencers may live in several games and platforms with the same persona. The same virtual

influencer might appear to a player during a social VR hangout, in a console game, and on Instagram-in each case, pushed into context-specific situations. An example of this would be the VI reminding you in the VR world of an event that is occurring in the MMO game later, and boundaries between individual game ecosystems are merged into a bigger digital life. This opens up some interesting possibilities: a VI can become your personal assistant in your gaming life, suggesting new games, introducing you to other players (matchmaking nudges to form parties/clans), etc. It is almost like Clippy in the Microsoft days, only much more likeable and embedded into the culture- maybe Clippy 2.0 is a VTuber who assists you with technology in an entertaining manner.

Behavioral Health Nudges: The need to have healthy gaming habits (e.g. taking breaks to prevent fatigue) is becoming more and more realized (World Health Organization, 2020). A virtual influencer may contribute to this by in-game saying, We have been on this quest long enough, a short rest would be nice. This is already done by some games using system messages (Nintendo notoriously had games that told the player to take a break). It could be more empathetically expressed by a character. On the same note, a parental control pop-up may not be well received by younger players as opposed to a friendly character telling them to be moderate. Prior studies in educational games indicate that characters can successfully assist children in learning (through repeating instructions in character, etc.), and therefore, the extension of that to broader health and safety nudges is plausible.

Community Ambassadors: We could have official virtual influencers who are community ambassadors who intermingle between players and developers. An example is a VI that may feature patch note videos or tutorials on new features, which essentially pushes the players to accept and learn about the changes in the game. Rather than a dry list of changes, a charismatic figure might take you through why the balance update in the game is so good, which would help to mitigate opposition to nerf or rule changes by putting them in a positive light. This is a PR and nudging role and in case the community likes the character, it may ease friction that usually comes with game updates.

Greater Academic and Regulatory Scrutiny: With the increased use of such techniques, there will be increasing studies that will look at their effects. Do players who use VI guides have a higher likelihood of remaining in a game? Do they spend more? Do negative psychological effects (e.g. over-attachment to the character, or feeling of manipulation) exist? Some of these questions will probably be empirically determined by 2025. In this new situation, regulators can also revise guidelines to provide consumer protection. As an example, labelling requirements may be applied in some way to virtual characters in games when they are in effect advertising. Industry codes of conduct might arise- perhaps an undertaking not to use virtual influencers to target vulnerable players or to make a clear distinction between in-character entertainment and commercial impetuses.

It is a very thrilling and a very fragile frontier. Even the composition of this paper itself tried to reflect a little of the human aspect-sometimes changing the tone and adding little foibles-as a recognition of the main theme that a bit of human-like incompleteness or personality can make the guidance of technology seem more authentic. To some extent, this is a simulation of what virtual influencers engage in: they are imitating humanity to establish contact. To game designers and psychologists, the implication is that a combination of narrative personas and behavioral design can be very effective. Gamers can be instructed, not only by code and logic, but by relationships-even when those relationships are with pixels and algorithms moulded into a smiling face.

To sum up, the shift to the interactive entertainment as the one that involves the transition between the gameplay and the guidance summarizes the way in which the interactive entertainment is taking a more active part in the process of user experience formation. An example of virtual

influencers that facilitate digital nudging is the inclusion of a social, emotional aspect in the toolkit of game design. They can be used to improve player interaction, education, and entertainment when applied intelligently, and game worlds will become more lively and accommodating. However, such power should be exercised in a responsible way, taking into consideration player autonomy and transparency. With the virtual and the real merging, the most important thing is to retain the trust of our players. After all, the magic of a virtual influencer is in the fact that players are ready to believe in them-and this belief, once gained, must be valued but not used. Through a well-considered approach and a sense of moral responsibility, virtual influencers might actually become our favorite companions in our online playgrounds, guiding us through the right direction to more valuable and fulfilling play activities

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