

Designing for playfulness in educational digital games: insights from Deleuze's concept of folding

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Abstract

Designers of educational digital games who want to promote playfulness in their work will find useful concepts and categories in the philosophical literature on play. However that literature, and the broader vocabulary of play, games and playfulness, has limits. Concepts such as the 'magic circle' describe the threshold of play well, but say little about the potential of any given game to be engaged with playfully, because of what goes into it and how it is formed.

To address this, we turn to the philosophy of Gilles Deleuze, and specifically his concept of folding. For Deleuze, anything we can perceive and experience – including a digital game – is a fold of a single reality, produced when forces come into contact. These forces include designers' intentions, but also coding traditions, economic models, cultural assumptions and historical movements. The fold produces what we call an interior 'play-space' whose character and affordances for playfulness are shaped by everything that went into that composition, not only what the designer intended.

We argue that understanding digital games as folds shifts the designer's role from author to reader of compositions. We develop three practical moves – introducing difference, holding productive chaos and smoothing – and apply them to three digital games: Blue Prince, Baldur's Gate 3, and Townscaper, chosen because they are unconstrained by educational agendas and so show these folds with clarity.

Considering digital games as folds in this way generates a diagnostic question for their designers that design thinking alone cannot: not 'did I build what I intended?' but 'what has this fold produced, and does it promote or foreclose playfulness?'. This enables designers to see where to push for more playfulness, and where to resist the forces that close it down, building an environment for risk-taking and confidence building. We close by translating this framework for designers of educational digital games, for whom, curricular, institutional and assessment pressures fold in alongside design intent, offering a design principle for each move and three questions to guide practice.

Keywords: Digital Play, Playfulness, Deleuze, Folding, Educational Game Design

Introduction

Literature on playful learning (Whitton & Moseley, 2019; Whitton, 2022) claims that playfulness is linked to features such as learner risk-taking, identity and sense of belonging. However, digital games for learning are not necessarily ‘playful’, meaning they do not automatically invite the exploratory, voluntary and joyful engagement that playfulness requires. In this article, we argue that enhancing playfulness in digital games can be supported by thinking differently about playful design in relation to the nature of play and how design thinking might be more playful.

In considering playful game design as underpinned by play theory, it is useful to draw a definitional distinction between games and playfulness. Games can be thought of as objectively identifiable activities that typically involve goals, rules, progression, and outcomes. While games provide objective structure, playfulness can be considered to be the subjective psychological attitude or disposition to play. Playfulness is that ability to consider any situation as an opportunity for exploration, subversion, humour, or curiosity. Playfulness is voluntary, intrinsically motivated, imaginative, accepting of failure, joyful and social, and it is when games are engaged with playfully that true play happens (Whitton & Moseley, 2024). While games and playfulness are connected, we can see they are not automatically so. For example, a professional sports match, featuring stress, a high degree of competition and a purely extrinsic goal can be a game devoid of playfulness. Or the opposite: an educator can play with ideas, pursue an amusing thought experiment, doodle, or conduct a fun demonstration that does not need a game format to be playful. At the same time, the structures, and artefacts (dice, spinners, counters) common in games can act as play signifiers that create the space to be more playful, as the stakes for perceived failure are lower than might otherwise be.

The metaphor of the magic circle (Huizinga, 1955; Salen & Zimmerman, 2004) is commonly used in game studies to describe a space separate from the real world, with rules mutually constructed and adhered to (to varying degrees) by the players. Within a magic circle, play can be free or occur within the more formal, rule-bound structures of games. Suits (1978) argues that games require the conscious acceptance of arbitrary rules just to experience the challenge of overcoming unnecessary obstacles. However, the metaphor of the magic circle has limits in terms of how they can equip educational games designers to design playful digital games. The magic circle draws sharp boundaries around the play-space and around the player’s consent to enter it. It describes the supposed threshold (i.e., this is play, this is not) but says little about what exists in the ‘play-space’ of a game. The magic circle has been critiqued within games studies for this very reason; not only does Stenros (2014) argue that while the term is ‘intuitively accepted’ as shorthand for a border between play and non-play, it is “one of many formulations” (p.147) of such a border, which consists, even at its most simple formulation, of both mindset and social contract. However the magic circle is

constructed, Consalvo (2009) argues that even a supposed ‘hard boundary’ between games and not-games does not hold in practice, given that play leaks and gets entangled with ‘real life’. Our position is that not all magic circles are created equal, and that it is useful for educational games designers to acknowledge and understand the differences between them. In this article, we present the concept of folding to help us to explore those differences.

Superficial treatments of play, games and playfulness do not help the designer of digital games, who may recognise Sutton-Smith’s (1997) arguments that play is fundamentally ambiguous. Designers of educational video games face an established vocabulary of play that struggles to account for its potentially open, emergent and unpredictable qualities. For example, it is important to appreciate that play can exceed its own rules in moments of surprise, produce unexpected events and generate something neither designer nor player anticipated, but the technical and conceptual limitations of video game design traditions may limit the application of playfulness to design.

To address these limitations, we undertake our own playful (subversive, boundary-testing) approach to further conceptualising the nature of digital games for learning and the playfulness possible within them. To conceptualise the nature of the ‘play-space’ of digital games, and the experiences one may have within them, we connect to the philosophy of Gilles Deleuze (1987, 1993, 1994), and specifically his concept of folding. We argue that Deleuze’s concept of folding can help us ask what this ‘play space’ is made of, what it is capable of producing, and what enhancing play and playfulness may involve for the designer.

Conventional design discourse rests on the tradition of post WWII instructional design (Branch, 2009; Reiser, 2001), in which the designer is author – fully in control and responsible for the outcomes their design produces, and design to ensure specified outcomes. However, as has been recognised in the discipline of design generally (e.g., Fry, 2012), design in practice is always more emergent and relational than conventional design narrative acknowledges, including in design for digital games. Salen and Zimmerman (2004) describe the designing of games a ‘second order design problem’ in which designers may set rules and mechanisms, but the play experience is generated by the player. Designers know that their plans do not survive intact after contact with the real world – as recognised by Warren Spector, designer of the video game *Deux Ex*, who saw players subvert the capabilities of the game to make progress in unorthodox ways, and endorsed what he termed ‘systemic design’, which should bound but not determine play in digital games (Alexander, 2013).

Digital game design leans on the unexpected, chaotic and random more than we might think. In the pedagogic and human-computer interaction design domains (Charteris et al., 2017; Nicenboim et al., 2025) there are established calls for a decentring of human subjects in design, and to recognise the designer as one element in an ‘assemblage’ of

forces that can be found in design (Giaccardi & Redström, 2020) that in effect co-design with the human designer. However, this perspective is not substantially applied to the nature of the ‘play-space’ in digital games or the experiences a player may have within them. We argue that our use of the concept of folding in this article does that, thereby shifting the designer’s role from one of ‘author of worlds’ to understanding what their composition (design) makes possible, which includes pushing for playfulness where it can be curated.

Deleuze and folding

Substantial parts of game design discourse centres the designer as author. For example, DeWinter’s (2015) work is an example of the critique of the ‘auteur model’ (the singular genius) for game designers, and Sicart’s (2014) approach is an example of the critique of proceduralism, which proposes that arguments or meaning can be ‘pre-programmed’ into games. In Salen and Zimmerman’s (2004) discussion of meaningful play, every element of a game’s design is understood to shape the player’s experience and is founded on intentional construction. These discourses emphasise the designer as someone who builds a system, sets rules and determines what players can and cannot do. However, this framing is already under pressure within game studies (e.g., Juul, 2005). Players consistently exceed designer intent, combining variables, find new paths, and produce outcomes developers never anticipated – creation of a game is never the sole purview of the designer. Saying this, we acknowledge that open world digital games have moved towards player freedom and agency, but even here, they still operate within a pervasive designer-as-author discourse.

Learning game design adds further complexity: learning outcomes, regulatory priorities, institutional contexts and learner diversity all shape the design process explicitly and implicitly. The gap between designed intent and what happens in digital play is well documented (Whitton, 2014). Here is the problem we address: if design alone cannot account for what a digital game is or does, we need a different way of thinking about what designers are doing and what they should attend to.

Seeing possibilities with Deleuze

To conceptualise both the process of digital game design and the nature of ‘play-spaces’ it creates, we draw on the work of Gilles Deleuze (1987, 1993, 1994). From his thinking, we explain why the concept of folding is potentially useful to learning game designers. In Deleuze’s ontology (i.e. what he says is real), there is no transcendental reality. Practically, this directs the designer of digital games to the material resources, of all sorts, that go into their formation. In addition, Deleuze’s work emphasises that *what could be* and *what we perceive to be* are both real, with what we perceive being ‘actualised’ potential. This highlights that many potential designs for digital games are possible, but most are never composed. Designing with these ideas in mind allows us to

consider what might be possible beyond convention and the status quo. They also help frame a more specific concept, that of folding.

Digital Games as Folds

Many things can be elements in the design of digital games, and they can be formed in countless ways, following Deleuze's thinking. Folding is the mechanism that selects and composes from what is available. When many different parts fold together through the conscious and unconscious, explicit and implicit activity of game design (to use Deleuze's language) a new interior is produced. An important aspect of this new thing, or interior (i.e. the digital game) is its potential playfulness, which is composed through the act of folding. We call this potential playfulness the 'play-space' of the game. Folding is not an abstract idea, is it the process of elements (e.g. traditions, code, manual labour and so on) forming together to produce a digital game. Crucially, the designer is also part of what is folded into the design. While there are elements that may be beyond the agency of an individual designer (e.g. a certain view of education, or the need for a certain format of game), their skills, interests and decisions are folded in. Given that, designers have a crucial role to play in promoting a game's interiority, or play-space.

This is why folding matters for designers of digital games for learning – two games can look similar from the outside, both can act as magic circles if approached playfully and are necessarily rule-governed, but both can have different insides (play-spaces) depending on how their forces have folded together and are composed. One can think of Wordle¹ before and after its acquisition by the New York Times – the before and after 'folding' of Wordle presented the same material interface and game design; yet the inside (play-space) of the second recomposed the original communal, unmonetized play as corporate forces of tracking algorithms, subscription mechanisms and branding were folded in.

Many of the forces involved in folding are tangible and designers can interact with them. As stated, designers themselves are part of the process of folding, adding their own preferences, styles and experience. As with Wordle, the inside, or play-space of a digital game is not reducible to its features or mechanics. Each digital game is more or less intrinsically playful, with its own degree of openness, strangeness, whimsy and habitability. Taking this understanding to the design of educational games, this can create new questions. Instead of asking "did I design what I intended?", the designs can ask "what has this fold produced, and what does it make possible?"

We argue that to interact and compose with these forces (e.g., a corporate desire to maximise micro transactions, an implicit sexism in early game pitching, or a subversive

¹Wordle is a daily online word-guessing game that was created and shared for free before being purchased by the New York Times in 2022.

but forgotten storyline that could be unearthed from previous games in a series) to promote playfulness, designers must be attentive to them, applying an understanding of the different affordances of games and playfulness and their abilities to create different forms of magic circle as well as how they can 'make space' for play in its many incarnations. One practical question that this generates for the designers of digital games is: where in this folded play-space is there room for more playfulness to emerge? Where are the openings, the flexibility, the unexpected combinations? At the same time, we should ask: what has been folded into this design process that has the potential to limit or negatively shape play?

Designing for playfulness

A designer who understands digital games as folds reads the folded play-space they are composing with, asking which forces (e.g., cultural, economic, technical, historical) have shaped this space, and what do they allow or prevent players from doing? A mindset of rewarding only 'correct' answers or an assumption that adults' educational games do not need to be 'aesthetic' may pressure a designer to produce a game not much more rewarding than a multiple-choice quiz. The risk, we argue, is especially present for educational games designers, who face a perceived challenge that digital games for learning should be 'serious', introducing a threat to any real playfulness.

To engage practically, it is useful to describe actions that designers can take to go beyond noticing what the game-as-fold is composed of so they can play their part in enriching the play-space (i.e. its potential for playfulness) or addressing features of the play-space that constrain playfulness. Deleuze (1994) names such actions in his body of work – actions that produce things, change things and open possibilities.

Philosophical detail is not required here, but we summarise three of these actions that can inspire any designer looking to enrich the play-space of their learning games. These actions concern the Deleuzian themes of introducing difference, utilising productive chaos and 'smoothing', and are set out below.

Introducing Difference. All games rely on difference to some degree – both snakes and ladders are needed to make that game work, for example. Without difference there would be a single, undifferentiated play-space, with no distinguishing features. However, to be playful, digital games must offer multiple opportunities to choose to act differently. For example, to act whimsically – a feature of playfulness – is to depart from the official path, to surprise, and even be absurd. If a digital game does not offer intriguing (even subtle, or hidden) invitations, such as an unexpected sound, an intriguing non-playable character (NPC), or a space in the game where rules of movement change, then whimsy is foreclosed. For Deleuze, difference is the force that produces something new, cascading up new patterns, rhythms and structures of play. Predictable sequences of clicking or swiping (dare we mention Candy Crush?), in which

each step is determined by the last, forecloses the unexpected, regardless of any exciting animations.

Productive Chaos. In Deleuze’s philosophical system, chaos is not disorder, but is a condition required for new things to emerge. For example, what would Mario Kart be like without its item system, the power-ups such as shells and boosts that any racer can pick up and use against opponents regardless of their position in the race. Blue shells and lightning strikes are chaos intentionally introduced to disrupt the predictable race. The skill for designers is to introduce just the right amount of chaos – so new events and forms can occur, but within a structure that also gives them an opportunity to be played with. When the video game No Man’s Sky introduced its procedurally generated universe in 2016, many players experienced it as too chaotic and lacking the right amount of structure to make worlds habitable and space travel meaningful. Famously, No Man’s Sky has subsequently contained its chaos to critical acclaim (Big Red Barrel, 2019).

Smoothing. In the inside of a fold, multiple forces crystallise, rarely in a neat way. Even the complexity of coding can be messy, requiring timely updates to fix multiple bugs. Seen as the inside of a fold, a digital game designer not only composes with code, but with all sorts of desires, priorities, technological trends, fan pressures and so on. As a result, the play-space of a game can become congested in explicit and implicit ways. This can be a problem that ‘playful’ designers need to attend to, as playfulness requires conditions for momentum, flow and free association between diverse elements. A game that makes little space for these things forecloses playfulness. The reason that The Legend of Zelda: Breath of the Wild² seems more playful than other games is that its designers learnt the lessons from previous titles in the series that interrupted momentum constantly – no more handholding tutorials, waypoint obligations, linear quest structures, notifications and so on. Smoothing is the action a designer can take to reduce friction, so that new playful patterns, structures and practices can emerge.

Instead of designers asking “did I design what I intended?”, they can ask “what has this fold produced and what does it make possible or foreclose?”, then act, guided by the concepts of promoting difference, introducing productive chaos and smoothing.

Playful potential in digital games: three examples

Here we apply the concept of folding to three examples of digital games designed for entertainment, each foregrounding one of the three designer moves to enhance playfulness. We focus on entertainment games here to avoid the additional complexity

² Legend of Zelda: Breath of the Wild is an open-world adventure game in which players explore a vast landscape with minimal guidance

of games designed for learning but following this, insights will be applied to educational digital games.

Example 1: Promoting playfulness in Blue Prince through difference

Blue Prince is a puzzle adventure game, released in 2025 by the small independent studio Dogubomb, in which the player inherits a mysterious mansion whose rooms reset and reorganise themselves every day. Each morning, the player drafts rooms by choosing from randomised options at each door, building a new path through the estate in search of the hidden room 46. No two runs produce the same mansion, because the same room placed in a different position creates different connections, puzzles, and narrative threads. Players have to accumulate knowledge across plays.

The interior play-space of Blue Prince is composed with elements such as puzzle book culture, the designers' background in card drafting mechanics and the freedoms that came with an extended time of solo indie game development. This produces a play-space unusually free of commercial pacing pressures, and one that trusts the player to wrestle with mystery across many runs without immediate resolution. The play-space feels unhurried and intellectually generous in ways that studio produced games often do not. The fold of Blue Prince is characterised by difference and that difference creates conditions for playfulness. Difference is built into the logic of the game itself, and the player is always encountering the unfamiliar, so playful exploration is rewarded in the connection of clues, new ways to move around the mansion and creation of multiple narratives. One must find out, experiment and be curious. In other games, difference is reduced as the player gains mastery, but as knowledge accumulates in Blue Prince new questions and mysteries open up rather than always being resolved.

Example 2: Promoting playfulness in Baldur's Gate 3 through chaos

Baldur's Gate 3 is a role-playing game set in a richly detailed fantasy world, in which characters make choices about their character, dialogue and combat that shape the story. Baldur's Gate 3 folds in role playing traditions, Dungeons and Dragons rule systems, and decades of video game RPG conventions. The influences of developer Larian Studios' experience of player-created chaos in their Divinity series is also apparent, as is the interest in table-top gaming that was rekindled by the Netflix Stranger Things series, and the COVID-19 pandemic. This produces a play-space that feels collective, even in single player mode, with the digital dice roll reminiscent of sitting around a table with friends, accepting shared uncertainty.

Central to the game is this dice roll mechanic – every persuasion attempt, combat action and spell carries real unpredictability. When a roll fails, a diplomatic conversation can turn to violence, a startlingly successful spell can have unexpected consequences, and a seemingly small choice can open up a whole new branch of the story and have ramifications much later on in the game. Rather than framing an unlucky

dice roll as ‘messing up’, the game’s unpredictability encourages the player to (literally) roll with the results of an unanticipated dice throw result. As players work with the roll of the dice, they demonstrate voluntary engagement, acceptance of failure and imaginative adaptation.

Example 3: Promoting playfulness in Townscaper through smoothing

Townscaper is a town building digital toy, released in 2021 and produced by solo developer Oskar Stålberg, in which players place building-elements to form a pleasant location, standing on stilts on the ocean. Folded into this play-space is Stålberg’s frustration with overcomplicated city builder games, his background in procedural generation research, and a rejection of commercial game conventions around goals and failure. This results in a play-space that feels restful, because nothing is demanded – no friction is present. When players click a location, the algorithm transforms those clicks into a house, arch, bridge, or tower with a satisfying ‘plop’. There are no goals, no ways of failing, no resource management and the ease of action easily creates unique and delightful towns at each play. In removing friction, Stålberg’s design work creates a form of smoothing.

These three examples demonstrate that thinking of digital games as folds, with internal play-spaces generates a diagnostic question that design thinking alone cannot. Across all three examples, difference, chaos and smoothing are not design features added to each game, they are properties of the fold that designers can read, attend to and work with. What folding reveals in each case is something invisible to a purely design-focused analysis: the forces and materials involved in each fold exceed the designers’ intentions, and produce interiors with their own character, affordances and conditions for playfulness. The invitation for designers is therefore not to copy these examples, but to ask the same question of their digital games as folds: what has been composed here, what does the inside (play-space) make possible, and where can playfulness be found or expanded?

Application of folding to educational game design

The forces that fold into a digital game designed for learning differ from those folded into Blue Prince, Baldur’s Gate 3, or Townscaper. Alongside coding traditions and designer intent, educational games routinely fold in curriculum mapping, institutional risk-aversion, assessment requirements and the need to visibly justify their presence in a classroom or course. These forces are often unavoidable and are not in themselves opposed to playfulness however, they are exactly the kind of force that can silently foreclose it, producing what is sometimes called “chocolate-dipped broccoli” (Bruckman, 1999): content delivery wearing the surface appearance of a game, with little of the interior play-space left intact. Reading educational games as folds gives

designers a way to notice this before it happens, and to translate each of the three moves already introduced into a working design principle.

- 1. Design for difference.** The fold produces a play-space that rewards accumulated curiosity rather than mastery, since no two runs repeat. For any digital game, the design principle is to optimise and prioritise points of genuine player choice, even within a fixed structure, so difference is always available. Translating this for learning, we need to build genuine learning choice within the curriculum, such as branching scenarios, optional side-puzzles/quests, or simply more than one legitimate route to the same learning outcome.
- 2. Design for productive chaos.** The fold produces a collective, unpredictable feel even in single-player mode, where failure opens new narrative branches. For any digital game, the design principle is to introduce a bounded degree of randomness and unpredictability players can work with, rather than eliminating uncertainty for reliability's sake. Translating this for learning, we need to allow unpredictability rather than focusing on assessment reliability; a manageable element of change, timing or consequence can make engaging with material feel playful rather than procedural.
- 3. Design for smoothing.** The fold produces a restful, low-friction play-space with flexible goals and recoverable failure states, producing pleasant experiences from simple interactions. For any digital game, the design principle is to question each piece of friction that convention demands and remove what doesn't serve the core experience. Translating this for learning, we need to remove institutional friction that reassures rather than serves the learner; mandatory tutorials, checkbox completion screens, and progress notifications can often be removed without losing rigour.

Building on these design principles, we suggest that educational game designers consider the forces beyond their own intentions, curricular, institutional, technical, have folded into a design, and which of them might not currently be attended to. We suggest considering where compliance or reassurance been folded in and mistaken for necessity, and what would a design look like with friction removed. Above all, understanding folds enables designers to think critically about the wider elements that have influenced a game design and the potential impacts and limitations of use in a real world neoliberal educational system.

Conclusion

We have argued that understanding digital games as folds – being all the things that designers co-compose with, and which result in an interior play-space – provides analytical tools that the existing vocabularies of the magic circle and design thinking cannot provide. The fold conceptualises what is on the inside of the magic circle and why it matters for playfulness beyond games.

The most important shift that occurs in thinking this way is about attention. Designers may choose to attend to the broader composition of game-as-fold and specifically, a game as the inside of a fold, which we have termed ‘play-space’. The forces designers co-compose with (e.g. cultural, economic, technical, historical) shape the play-space in ways that exceed and sometimes undermine intentions of playfulness. Designers of digital games for learning, looking to promote playfulness in their games, can adopt at least three moves: introducing difference, holding productive chaos and smoothing. Our diagnostic question is simple: what has this fold produced and does it promote or limit playfulness? Designers, educators and players of digital games who ask this question can take practical action to promote playfulness.

We offer this paper as a provocation: an invitation to think differently about what digital games are and what they can produce, not a closed argument to be accepted or rejected outright. Our thinking can be tested and extended in multiple ways: interviews with designers about the forces they composed with; ethnographic work with designers and players; or analysis of gameplay video for limits of playfulness. A more rigorous synthesis of game design literature, playful learning literature and relevant philosophy of process and experience, would clarify the extent to which concepts from these fields align and where they produce further questions. Rather than closing that conversation, our paper is designed to provoke it. Finally, our invitation is to reflect on the examples in this paper and look at your own digital designing as a process and result of folding – to ask what has been composed in that folding and where playfulness can be found or expanded. In this way we believe that folding provides a useful tool to surface the unseen and attend to it.

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