

Creativity and Digital Game-based Learning: A Game Selection Framework for New DGBL Teachers (feat. *Animal Crossing: New Horizons*)

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Abstract: During the global COVID-19 pandemic, there was a significant increase in the popularity of digital games around the world. However, the adoption of digital games in education has mostly remained stagnant due to significant barriers faced by new teachers of digital game-based learning (DGBL). These barriers include the lack of easy-to-grasp resources on digital game selection and creative pedagogical ideas to integrate digital games into their lessons. To address this issue, this paper proposes a three-stage filtration system for the selection of DGBL-friendly games to fill the niche. The system consists of three filters: game acceptance, game design, and game support. These filters serve as stages for efficient identification, screening, and inclusion processes respectively. To demonstrate the effectiveness of the proposed framework, the Nintendo Switch game *Animal Crossing: New Horizons* (ACNH) is used as a case study. Virtual interviews with experienced (student) players of ACNH are conducted and excerpts from these interviews are documented. Additionally, ample creative ideas for adapting the digital game are provided. By implementing this three-stage filtration system and using ACNH as a case study, this paper aims to provide valuable insights and practical examples for educators to overcome the barriers they face when incorporating digital games into their teaching practices.

Keywords: digital game-based learning, DGBL, creativity, animal crossing, game selection

1. Introduction

During the global COVID-19 pandemic, the world has turned to digital gaming as the source of joy, fun, relaxation, decompression, as well as a means of escape from reality. According to reports by Entertainment Software Association (2020; 2022), there are about 227 million video gamers in 2021 in the U.S. (up 11% from the pre-pandemic 2019). Among them, 74% of parents play video games with their children weekly (up from 57% in 2019), 80% of Americans believe video games have educational benefits for their children (up from 74% in 2019), and 68% agree that video games offer opportunities for their children to improve their creative skills. This overwhelming level of digital game acceptance is strong evidence of the immense potential for digital game-based learning (DGBL) to become mainstream in education.

The term digital game-based learning (DGBL) is notably defined by Prensky (2001, pp. 145-146) as “any marriage of educational content and computer games” or “any learning game on a computer or online”. Special purpose game and off-the-shelf commercial game are the two main types of digital games in DGBL. The former is purposefully created with an aim to educate its players about a particular subject matter, while the latter is developed mainly for entertaining purposes (All et al., 2016). In the case where the scope is focused on pedagogical processes leading to the achievement of intended

learning outcomes rather than the game content and design or gaming, a few scholars have suggested that the term digital game-based teaching (DGBT) be distinguished from DGBL (Pivec & Pivec, 2010). However, DGBL remains as the dominant term adopted in literature even when teaching and pedagogies are discussed. It is worth noting that DGBL is conceptually different from gamification, which is commonly defined as the “use of game design elements in non-game contexts” (Deterding et al., 2011, p. 10) to perform tasks that one would ordinarily not attempt (McGonigal, 2011). Since the scope of this paper examines how a digital game can be used for teaching and learning, DGBL is a more suitable term to use in this context.

DGBL began to surface between 1980s and 1990s with educational theorists arguing the possibility of implementing digital games in classroom settings. For example, Malone (1980) and Bowman Jr. (1982) argue that fun digital games can enhance student involvement, extrinsic and intrinsic motivation, and as a result, the effectiveness of learning. Subrahmanyam and Greenfield (1994) suggest that video games might be useful in developing spatial abilities. Heinich (1996) provides a lesson plan on using computer-based simulation games in class. However, formal DGBL research only took shape in 2000s and Prensky (2001) is commonly credited as the researcher who popularised DGBL. Interests in the approach has grown exponentially in the last two decades, and there is now a significant body of DGBL literature which focuses on measuring motivation (e.g., Erhel & Jamet, 2013; Papastergiou, 2009), learning effectiveness (e.g., All et al., 2016; Erhel & Jamet, 2013; Hou & Li, 2014), problem-solving (e.g., Kiili, 2007; Kim et al., 2009), engagement (e.g., Connolly et al., 2012), and assessing educational values in digital-game design (e.g., Hong et al., 2009), to list a few.

From an academic perspective, there is a wealth of literature on DGBL and related publications have been on an upward trajectory since early 2000s. This means there should be adequate academic resources to satisfy teachers’ enquiries. However, despite DGBL receiving a high degree of academic attention, the adoption of digital game-based activities in education is still far from becoming mainstream (Blume, 2020). Strangely, the academic community does not seem to be interested in finding the root cause, as very few studies have attempted to look into the issue, let alone providing a practical solution. Becker and Jacobsen (2005)’s quantitative study is a rare attempt that has provided useful insights of the situation, shedding light on difficulties faced by new DGBL teachers, in particular. The researchers analysed 109 e-survey responses from K-12 teachers in Canada and found a number of the major barriers faced by teachers in implementing DGBL. Some barriers include:

- a) the lack of understanding in gaming or ways to integrate games into lessons (i.e., both hardware and software),
- b) the lack of knowledge in game selection (both in terms of learners’ interest and suitability for teaching and learning),
- c) high cost (e.g., time and effort) in teaching preparation, and
- d) low return (i.e., DGBL is not schools’ priority) in learning outcomes.

In addition, the researchers also noted the lack of solutions to the identified problems, so much to the point that “anything that can be done in the way of support in this arena, including online resources and repositories that are easy to find and navigate, is likely to have a positive impact” (Becker and Jacobsen, 2005, p.8). In other words, in order to help DGBL teachers overcome these barriers, there is a need to first overcome another major problem – the lack of helpful resources tailored to the needs of new DGBL teachers.

Current assessment frameworks/models for evaluating educational values of digital games in literature, while important in research, are less applicable in practice. Firstly, they are fundamentally built upon empirical quantitative data commonly collected from expert game designers (Hébert & Jenson, 2019) and scholars who are familiar with a particular game (e.g., All et al., 2016), but rarely do these relevant studies gather comments from experienced (student) players of the games, or aim at guiding new DGBL teachers. Understandably then the product is expert-oriented rather than practitioner-oriented.

Secondly, these frameworks/models generally have a high barrier to entry for practitioners: they are complex and research-oriented in design, thus requiring a heavy investment of time and effort from the teachers' side.

There are at least three debatable assumptions embedded in the methodological approach of these studies: 1) the assumption that experts know more about gaming than gamers/teachers; 2) the assumption that experts know what gamers/teachers need; 3) the assumption that new DGBL teachers have adequate understanding of multiple games to accurately perform their game evaluation using experts' models.

Assumptions 1 and 2 are false when experienced gamers are considered because in this highly market-driven paradigm of modern game design, game developers should continuously seek gamers' critical comments and reviews to improve their designs in subsequent online update patches. Assumptions 2 and 3 are also false when new DGBL teachers (especially teachers with little gaming experience) are considered. The return-on-investment of time and effort to familiarise with both the game to be analysed and the complex assessment criteria within existing frameworks is simply too low for most new DGBL teachers to attempt. As Becker (2007, p. 479) points out, teachers rarely "have the time to locate, review and synthesise findings from scholarly publications and then create lesson plans from scratch using what for many of them is an unfamiliar technology". Even if some teachers can afford to conduct analyses, the results often remain as abstract concepts which cannot be easily translated to useful information for game selection nor lesson planning.

As seen from the above discussion, there is clearly a research gap to fill in terms of providing new DGBL practitioners with an applicable, low cost-high return, low barrier-to-entry game selection framework. Success in accomplishing this endeavour would provide educators with a go-to resource to initiate their DGBL projects, ensuring that the benefits derived from their investment of time and effort are significantly proportional. Therefore, this paper aims to provide valuable insights and practical examples for educators to overcome the barriers they face when incorporating digital games into their teaching practices.

In the following sections, I first draw evidence from relevant literature to review some variables that will likely affect new DGBL teachers in the process of digital game selection. I then propose a cost-effective framework for selecting a DGBL-friendly digital game, placing special emphasis on helping teachers who are new to digital gaming. To illustrate the application of this framework, the Nintendo Switch game *Animal Crossing: New Horizons* (ACNH) is utilized as a case study. Furthermore, this study offers valuable and creative examples to enhance educators' understanding of the framework and facilitate the development of engaging teaching materials.

2. Variables Affecting New DGBL Teachers' Game Selection

Drawing findings from relevant DGBL literature, I contextualise some variables that will likely affect new DGBL teachers in the process of digital game selection.

2.1 Game Acceptance

Game selection is one of the first steps of DGBL, and for new DGBL teachers, identifying suitable DGBL-friendly games for teaching can be a major obstacle. To quickly narrow down a search to a manageable number and minimise time spent on trialling random games, it can be highly efficient to consider a game's level of acceptance as it is identified in studies as a main prerequisite for effective digital game-based learning (see Davis, 1989; Hou & Li, 2014; Hsu & Lu, 2004).

Two objective considerations of game acceptance are the game's popularity and recognition.

2.1.1 Popularity

Popularity has been the indisputable reason justifying research on pop culture (including digital games) in the field of cultural studies (Pennycook, 2007). In the context of digital game, it is commonly measured by the number of players participating in a game and may be represented in the forms of aggregate review scores (e.g., from Metacritic) (Tyack et al., 2018). Popularity is a 'from below' phenomenon driven by digital gamers rather than game publishers. This provides strong evidence of usability from the gaming community (Livingston et al., 2010). Popularity also has a positive correlation with the longevity of the game (Choudhury et al., 2018), which should be an important consideration for teachers who are looking to invest time and energy developing DGBL activities.

2.1.2 Recognition

As opposed to popularity, recognition is a 'from above' concept that refers to a formal achievement of a digital game and is generally recognised in the forms of game awards honoured by established bodies in the video game industry. Given that teachers often have limited time to trial various digital games and may be less informed about the latest development in digital games, it can be time-saving to use lists of award-winning games as the point of departure in the search for a suitable digital game.

Because both popularity and recognition are highly accessible information on the internet and that popular and recognised games can better sustain players/learners' long-term interest, selecting a potentially DGBL-friendly digital game from a list of popular and widely recognised games can save teachers valuable time. It is worth noting that both popularity and recognition are not viewed from a teacher's perspective because they are not teacher-centred concepts. Instead, they are concepts 'from below' and 'from above' respectively', allowing teachers to approach the discussion 'from around' or 'from the sides'.

2.2 Game Design

Game design has been the focus of numerous studies on educational (digital/video) games (see for Dondlinger, 2007; Hong et al., 2009; Ibrahim et al., 2012; McGann et al., 2019; Wei & Li, 2010, for reviews of related literature) and has shown to be correlated with students' level of game acceptance in digital (simulation) games (Chang et al., 2009). Game design is particularly crucial to the success/failure of a DGBL lesson because a poorly designed game can add cognitive load to players, which can lower motivation and learning effectiveness (Ibrahim et al., 2012).

Many existing frameworks of game design have, understandably, emphasized factors or elements within the digital game itself. Prensky (2001, p. 119) posits that all digital games should include six structural elements: rules, goals and objectives, conflict/competition/challenge/opposition, interaction, and representation or story. Hunicke et al.'s (2004) Mechanics, Dynamics, and Aesthetics (MDA) framework proposes a taxonomy that includes sensation, fantasy, narrative, challenge, fellowship, discovery, expression, and submission. And more recently, Pawar et al. (2020) suggest three emerging factors, namely, emotional design, musical score, and game mechanics design. However, while these frameworks are important at the time they were proposed and useful in their own right, they are not developed with the notion of internet connectivity (i.e., online gaming) in mind. In fact, because internet communications have improved dramatically over the last two decades, many modern digital games have placed significant emphasis on maximising the benefits of internet connectivity. Five relevant variables are discussed in this section: freedom of creativity, the mechanism of sharing, target audience, the mechanism of collecting, and the ownership of virtual time and game pace.

2.2.1 Freedom of Creativity

Arguably one of the most crucial and significant changes in game design in the last two decades is the transition from 'designed' creativity (i.e., all digital game elements that are created and permitted by game designers) to 'designable' creativity (i.e., taking all the digital game elements that are created and

given by the game designers to freely create a game and thus a virtual world that an individual player wants). Examples of popular games of this type are often simulation games such as the Sims series (Electronic Arts Inc., n.d.), Transport Tycoon (Sawyer, n.d.) and the Super Mario Maker series (Nintendo, n.d.), but also include any games of which their computer codes can be modified by players themselves.

The ownership of creative freedom is crucial to any DGBL teachers who intend to create their unique digital e-learning environment, because it grants players/learners the power to establish their identity/individuality, which can be a strong motivator of learning. Cuenca and Martín Cáceres (2010, p. 1344) argue that freedom of creativity in digital games, from a Social Science perspective, can “help to construct the personal and collective identity of individuals, through the characters with whom they interact and the actions that these take”, essentially allowing players/learners to be their ideal virtual-selves.

2.2.2 The Mechanism of Sharing

When choosing a multiplayer online game for DGBL, teachers should place strong emphasis on the mechanism of sharing. The mechanism of sharing can be realised in many forms of virtual interaction in digital games, such as in the exchange of text messages, sound effects, facial and body expressions, and virtual items (e.g., in-game collectibles, and custom-designed virtual items). Research has shown that digital games with these means of social interactivity can have positive benefits to players/learners’ psychological and social well-being (Halbrook et al., 2019). In addition, the availability of item sharing via the internet provides flexibility for DGBL teachers to share customised in-game materials with players/learners.

2.2.3 Target Audience

When selecting a DGBL-friendly game, teachers will likely consider its suitability based on the target audience's age and needs, which determine the subject/topics taught, the content of lessons, types of in-class activity, ethics, and any ethical issues with the use of the game in teaching.

2.2.4 The Mechanism of Collecting

Everyone loves collecting. It is suggested that “[a]t a fundamental level, gathering or collecting objects of all kinds is part of human psychology” (Dillon, 2019, p. 255). There is a large body of literature on the psychology of collecting, theorizing the many reasons why humans love to collect items. According to Dillon (2019, p. 256), the consensus among social scientists and historians is that collecting is commonly motivated by “interest, identity, and the provision of personal satisfaction or pleasure.” All these motivations can be satisfied if the mechanism of collecting is implemented. The mechanism of collecting is also closely related to a reward system, which shapes players/learners’ behaviour through positive reinforcement by offering rewards after the completion of tasks (see reinforcement in Skinner, 1947), and is key to players/learners’ engagement (Johnson et al., 2016).

2.2.5 Ownership of Virtual Time and Game Pace

It is important for players/learners to have ownership of virtual time and game pace in order to facilitate learning. The former allows one to control the ‘time’ construed in a digital game, while the latter gives freedom to attempt tasks at one’s own pace without time limit. Alessi and Trollip (2001, p. 21) argue that time and pace affect the ease of perception, and “information presented too quickly or too slowly will increase the difficulty of both attention and perception”. Ibrahim et al. (2012, p. 30) echo that both playful and educational game content should be adjusted to fit players’ preferred pace, as this would give players “the opportunity to construct a personal profile, and encourage him or her to master the game and complete all steps of the newly customised environment”. Essentially, students should be given adequate control of virtual time and game pace to attempt and return to a task at a later time.

2.3 Game Support

Game support is the support to a digital game either provided by the official channel or external/third parties. It is an area which, to my knowledge, has been largely ignored in the current literature but is a critical consideration for all DGBL teachers because it concerns the long-term usability of digital games for DGBL. These three aspects are longevity, social connectivity/interactivity, and community support.

2.3.1 Longevity

Longevity of a digital game involves the duration of which the game can last before its official game support ends, and consequently losing its online-playing functionality. According to Owen Mahoney, CEO of video game maker Nexon, longevity positively correlates to the popularity of the game and “is probably the single most important idea in video games” (Choudhury et al., 2018). It is important for teachers to take longevity into consideration to avoid creating teaching and learning resources for a game that is reaching the end of its playable lifecycle. Teachers should also prepare a ‘Plan B’ for the digital game they pick (see section 3.3.3), so that certain aspects of teaching can also be retained even if the game servers are permanently shut down. In general, popular games have a longer playable lifespan, such as EverQuest (since 1999), Ultima Online (since 1997), and Final Fantasy 11 (since 2002) (Gerencser, 2021).

2.3.2 Social Connectivity/Interactivity

Social connectivity/interactivity in the current context of digital games refers to the capability for players to communicate/interact with one another in-game via internet connection. Through social connectivity/interactivity, players/learners can provide help to one another, “create, expand or animate their social network” and promote participation, teamwork, as well as the digital game itself using the communication channels provided by the game (Bouvier et al., 2014, p. 500). As a result, the game’s popularity can be maintained, which directly contributes to its longevity. DGBL teachers can also utilise these channels to provide teaching and learning instructions, facilitate in-game activities, share (multimedia) resources, bond with students, and build rapport.

2.3.3 Community Support

Community support refers to both technical and educational support offered not by official channels, but unofficially by communities made up of fans and supporters of digital games. Gaming communities generally support players by sharing homemade in-game modification tools (or mods in short, see Tyack et al., 2018) such as skins, opensource programming codes, modding guides and tutorials, as well as walkthroughs and hacks produced or discovered by gamers. Through these communities, creativity is refined, formed, reformed, implemented in-game, and shared beyond-game (i.e., via the internet).

The reason that community support can be a crucial aspect of the game selection process for DGBL teachers is twofold. First, many useful resources are already created by gaming communities and are readily available on various online platforms, thus teachers need not spend extra time and effort on reinventing the wheel. Second, unofficial support and tools help to extend the lifespan of a game, particularly when a game company decides to end its official support or discontinue the game. For example, The OpenTTD (2021) project is an unofficial extension of Transport Tycoon (Sawyer, n.d.) which has been supported by its community since 2005. Therefore, community support is a significant, long-term developmental aspect that DGBL teachers should seriously consider.

2.4 A Three-stage Filtration System for the Selection of DGBL-friendly Games: A Proposal

Based on the needs and variables discussed in the previous sections, I now propose a three-stage filtration system as a framework for the selection of DGBL-friendly games (see Figure 1). The word ‘filtration’ is meant both metaphorically and literally as the process of DGBL game selection uses three ‘filters’ to remove the less suitable digital games, leaving only the most DGBL-friendly ones as a result.

Inspired by Page et al.'s (2020) PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) statement and its three-stage design (i.e., identification, screening, and included), this filtration system also consists of three stages: *Stage 1 filter* uses **game acceptance** as an identification strategy for teachers to search for their choices from a large pool of available digital games; *Stage 2 filter* provides teachers with several key considerations for screening in terms of **game design** which may directly affect the planning of lessons and activities; *Stage 3 filter* looks at the aspect of **game support** to determine if a digital game should be included based on its suitability for a sustainable development of teaching materials.

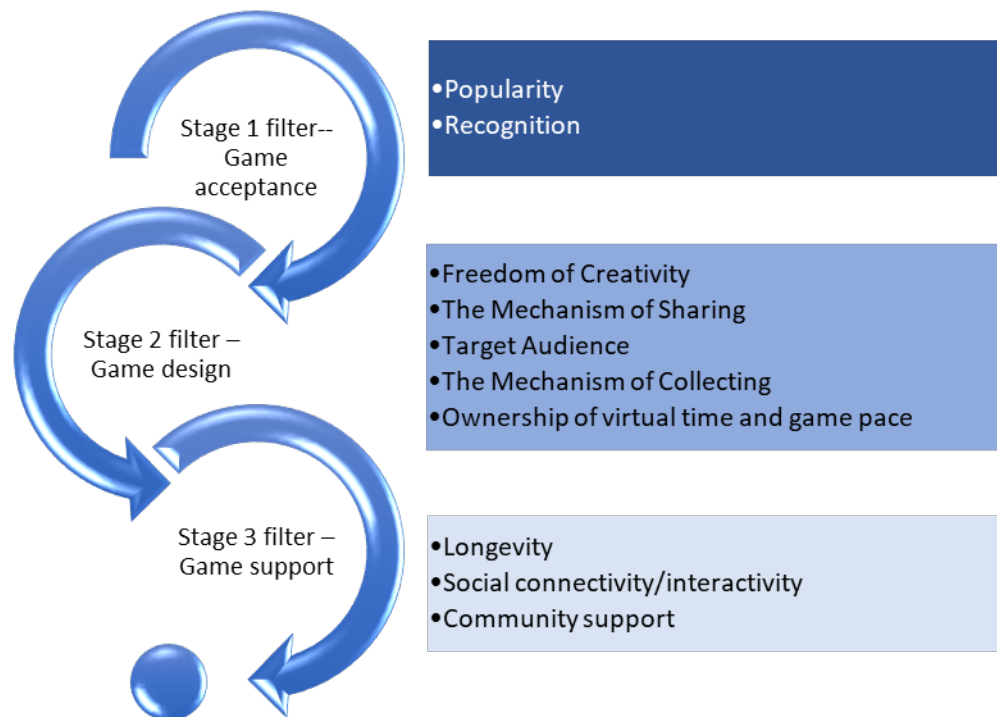


Figure 1. Three-stage filtration system for the selection of DGBL-friendly games

Each filter is comprised of relevant constructs that can facilitate game evaluation and selection. Stage 1 filter (game acceptance) consists of two constructs: popularity and recognition. Stage 2 filter (game design) is formed by five constructs: freedom of creativity, the mechanism of sharing, target audience, the mechanism of collecting, and the ownership of virtual time and game pace. Stage 3 (game support) comprises three constructs: longevity, social connectivity/interactivity, and community support. A digital game should at least meet the standards of some constructs before it can pass a specific stage to the next.

It is noteworthy that variables from different stages may be interrelated rather than mutually exclusive. For example, freedom of creativity in game design (Stage 2 filter) affects social connectivity/interactivity in game support (Stage 3 filter). The overall Stage 2 filter on game design also influences Stage 1 on game acceptance, while community support from Stage 3 filter is an instantiation/extension of popularity (Stage 1 filter). However, for the purpose of game selection, the linear progression in this proposed framework shall not affect the quality of the final result.

3. Animal Crossing: New Horizons (ACNH): A Demonstration of the Proposed Framework

In this section, a demonstration of implementing the three-stage filtration system for the selection of DGBL-friendly games is discussed. As a demonstration of how the proposed framework can be applied, each step is explained in detail using ACNH. ACNH is the fifth game in the main Animal Crossing (AC) series. Available on Nintendo Switch, it is a life-simulated game in which a player controls an avatar/character who purchased a getaway package from Tom Nook, the founder and owner of Nook Inc, and moved to a deserted island (Nintendo, 2020). This game allows the players to customize the island offline and interact with other players on the internet. This game is chosen because the “virtual togetherness” (Animal Crossing: New DH, 2020) that ACNH offers is making significant positive impact on humanities amidst COVID-19, and interest is growing in academia (Leporati, 2020). For instance, existing papers have looked at ACNH’s economic success (Mateer & O’Roark, 2020), game design (Stephens & Exton, 2021), impact on well-being (Barr & Copeland-Stewart, 2021; Johannes et al., 2021; Pearce et al., 2021), general psychological behaviour (Vuong et al., 2021; Zhu, 2020), and public identity (Comerford, 2020b) during the coronavirus pandemic. A special issue devoted to the Animal Crossing series can be found in *Loading...* (2020), the Journal of the Canadian Game Studies Association.

In addition, to address the absence of player/learners’ voice in existing literature, excerpts from virtual interviews (conducted on January 20, 2022 during COVID-19 lockdown) with two experienced ACNH student gamers/YouTubers via Instagram chat are included to supplement the discussion wherever appropriate. At the time of conducting the interviews and this writing (February 2022), female interviewee one (hereafter the ACNH-character pseudonym ‘Kiki’) completed her postgraduate degree in the United Kingdom in 2021, and female interviewee two (hereafter the ACNH-character pseudonym ‘Ruby’) is in her third year of undergraduate study in Hong Kong. Kiki and Ruby have played multiple games in the Animal Crossing series since 2007.

3.1 Stage 1 Filter – Game Acceptance

3.1.1 Popularity

The internet — the previous titles of AC were launched at a time when the streaming/gaming/‘let’s play’ culture was not in the mainstream yet; ACNH being the first AC franchise published during Web 2.0 has been greatly boosted by the technologies and culture of the recent decade. (Ruby, year 3 undergraduate student, Hong Kong)

ACNH, Nintendo’s second ever bestselling game on Switch as of 31 September 2021 (34.85 million copies worldwide) (Nintendo, 2021), is published during the COVID-19 pandemic on 20 March 2020 and has been a global phenomenon ever since.

ACNH has shown to be widely popular among celebrities, singers, rappers, and politicians, including Hollywood actress Maisie Williams, Blink 182’s lead vocalist Mark Hoppus, U.S. politician Alexandria Ocasio-Cortez (AOC), and U.S. President Joe Biden (Lane, 2021a). Celebrities also appear as avatars on *Animal Talking*, a live-streamed ACNH talk show on Twitch and YouTube (Whitta, 2006), to connect with the ACNH fan-base as well as to promote their work. Well-known guests on the show include English musician Sting, American rapper T-Pain, actresses Felicia Day and Brie Larson, actors Danny Trejo and Greg Grunberg, and singer Selena Gomez (see Figure 2). It is also the most tweeted game on Twitter in 2020 (Chadha, 2021). This shows that ACNH has the potential to capture the attention of the audience from a broad spectrum.



Figure 2. Selena Gomez as ACNH avatar on Animal Talking talk show

3.1.2 Recognition

ACNH has won some of the most prestigious awards in the gaming industry since its launch, including the Famitsu Dengeki Game Awards 2020's Best Game in China and Game of the Year (Stenbuck, 2021); the Game Awards 2020's Best Family Game (Stedman, 2020); Japan Game Awards 2020's Minister of Economy, Trade, and Industry Award, Award of Excellence, and Grand Award (Robinson, 2020); the Golden Joystick Awards 2020's Nintendo Game of the Year (Tyrer, 2020); the British Academy Games Awards 2021's Game Beyond Entertainment, Multiplayer (BAFTA, 2021); along with numerous nominations.

Since both popularity and recognition are satisfied, ACNH can safely pass the Stage 1 filter on game acceptance.

3.2 Stage 2 Filter – Game Design

3.2.1 Freedom of Creativity

ACNH provides a creative outlet as in allowing players to decorate their own islands, houses, characters and even villagers to our heart's content. (Ruby, year 3 undergraduate student, Hong Kong)

It gives a sense of satisfaction because we can enjoy the fruit of your time and efforts. (Kiki, Master's degree holder, United Kingdom)

Within the premises of a game such as ACNH, players can change their avatars' names, hairstyles, facial appearances, clothes, facial and body expressions through a given set of options, or freely design their very own face-paintings and clothes to express their identity/individuality. Identity/individuality can also be construed through placing a wide range of furniture items collected in-game on the island as well as residents' home. Certain furniture items permit customisation, allowing players to add their very own designs to the items.

Using terminology from Law's (2020) digital creativity multimodal analysis (DCMA), all given features and items can be considered as endo-references as a player's creativity is construed using what

are originated from within the game, whereas items that are custom-designed by a player can be considered as exo-references as they are not originated from within the game but rather beyond the game. Through combinations of endo- and exo-references, a practically unlimited patterns of creativity are both formed and reformed, unleashing unbounded creativity potential for its players, which is an essential element that sustains a learner's motivation.

An abundance of creativity can be found on social media and video sharing platforms such as YouTube. For a list of ACNH-inspired productions exhibiting high-level digital literacy, cinematographic knowledge, and story-telling skills, see *Evil Imp* (2020), *Densle* (2011), *Chiinya Channel* (2020), and *Gugee Crossing* (2020) (Figure 3).



Figure 3. Digital storytelling of the Momotarō (“Peach Boy”) Japanese folklore by Gugee Crossing (2020) on YouTube

An extension of these skills can be found in the world of music, where re-creativity is realised through utilising ACNH to produce cover versions of popular songs, MTVs and soundtracks. Examples include KPop cover songs and MTVs by Maedong (2020), blending music performance with augmented ACNH animation by MinimeL (2020), and an “endless life jam” of an ACNH theme song by String Player Gamer (2020) with 48 musicians.

Industries are fully aware of the vast ACNH fan-base and creativity potential and have been actively capitalizing these business opportunities, such as in film (Ramos, 2021; Terry, 2020), fashion [e.g., Loewe, Prada, and GmbH (Taylor, 2020; Yotka, 2020), UNIQLO (2021), and Puma (2021)], electronics [e.g., LG (2021)], toys [e.g., Build-A-Bear (1999), and Hasbro (Holt, 2021)], and homeware [e.g., IKEA Taiwan (2020)].

Experienced teachers and expert educators should be able to find useful ideas from these examples to adapt in their teaching.

3.2.2 *The Mechanism of Sharing*

For a game such as ACNH, the mechanism of sharing plays an integral part of the design. Players can create custom designs for a variety of items via the design app on their NookPhone, a virtual smartphone in the game. These items include face-paintings, wall and floor tiles, hats, caps, clothing, umbrellas, small flags, uchiwa fans, and photo stands. Custom designs can then be published on the ACNH Custom Designs Portal/game server and shared with anyone on the internet via unique 14-digit Design IDs, or Creator IDs if players wish to share their published designs by batch (see Figure 4). In

the game's first year, over 12 million custom designs created by ACNH players have been uploaded to the ACNH servers and shared on the internet (Nintendo, 2021).



Figure 4. Sample custom designs of umbrellas as 3D wooden boxes using optical illustration; creator ID included (Gugee Crossing, 2021)

Museums are among the quickest to recognise the mechanism of sharing in ACNH and the opportunity for promoting #MuseumAtHome in the versatile game during the COVID-19 lockdowns in 2020. They have created downloadable virtual arts and hold virtual exhibitions [e.g., San Antonio Museum of Art (2020); The Metropolitan Museum of Art (2020)], many of which are in collaboration with universities [e.g., Ashmolean Museum Oxford (n.d.) and University of Oxford; Mayborn Museum (2020) and Baylor University; The Magnes Collection of Jewish Art and Life (2021) and University of California, Berkeley; Bell Museum (2020) and University of Minnesota; J. Paul Getty Museum (n.d.) and University of Edinburgh (Cromar, 2020)]. These initiatives allow the appreciation and education of arts as well as the ownership of virtual arts from a distance (Crow, 2020).

3.2.3 Target Audience

Generally, choosing a game with ESRB Rating of “Everyone” (Entertainment Software Rating Board, 2022) such as ACNH should suffice, as the rating indicates that the game content is mostly suitable for all ages. However, it may be advisable to look for examples from existing work and projects that target a similar audience type.

For the case of museums using ACNH, the collaborations with universities are well-planned rather than coincidental, targeting specifically millennials/Gen Z (Khan, 2020), who are currently entering or have entered universities (Povah & Vaukins, 2017). According to Animal Crossing series producer Hisashi Nogami,

What would the public imagine if they were asked what kind of game Animal Crossing is? I think there is probably an image of ‘a game where you can live leisurely with cute animals’ and ‘a game for young girls’. However, looking at the gender and age data of Animal Crossing users, it is clear that the ratio of males and females is half and there are many users in their 20s and 30s. (see Craddock, 2020)

Because this age range overlaps with the age of university students in most countries and that ACNH has a global reputation, it is not difficult to understand why universities are using this game for various

social and educational activities to target their audience. For a list of creative examples, see the Harvard Law School, (2020); the University of Lincoln Students Union (n.d.); Kent State University (n.d.); Purdue University (2020); Cornell University (2021); Hannan University (2021), The University of Hong Kong (2020a, 2020b; Law, 2021) and notably, the Digital Humanities Award-winning talk series Animal Crossing: New Digital Humanities (Digital Humanities Awards, 2021), hosted by Dombrowski from Standard's Digital Humanities (Stanford University, 2021) and Grumbach from Arizona State University.

Like many other digital games, ACNH is also popularised via YouTube, which accounts for 77% of the U.S. internet users between 15 and 35 years of age (i.e., about the same age range that has the highest number of ACNH players) as of 3rd quarter 2020 according to Statista (2022). ACNH YouTubers around the world stream their ACNH gameplay and walkthrough on YouTube and Twitch for followers to watch. Several well-known ACNH YouTubers at the time of this writing include iHasCupquake (2010) with 6.99M subscribers, ZackScottGames (2010) with 4.94M subscribers, Austin John Plays (2007) with 1.9M subscribers. The work by these gaming YouTubers in turn attracts even more followers to play the game.

3.2.4 The Mechanism of Collecting

It has different goals that aren't too difficult to achieve that motivates you to keep playing: collecting furniture, collecting creatures, paying mortgage, decorating my house to earn 'happy home' rankings, win villagers' hearts. (Kiki, Master's degree holder, United Kingdom)

ACNH is an exemplar of a well-designed digital game which satisfies players' need for collecting. The Nintendo Switch game has a total of 80 different bugs, 80 fishes, and 40 deep-sea creatures for players to catch. Once caught, critters will be registered in a virtual NookPhone app known as Critterpedia. Critterpedia is similar to an encyclopedia, offering information on critters' names, active seasons and hours of day, as well as locations of which critters can be caught (Fandom, n.d.). Apart from collecting virtual critters, players can also dig up fossils on the island ground, and buy rare artwork from Jolly Redd the fox salesman who sells replicas as well as genuine ones. Taking these fossils and artwork to Blathers, the director of museum on the island, and the knowledgeable owl will assess the fossils and artwork for the players. Fish, insects, fossils, and artwork can be donated to the museum, where players can visit any time of the day and learn information about them. ACNH also celebrates the International Museum Day annually by holding a Stamp Rally event in which players can visit Stamp Stations located in various galleries to collect stamps on a Stamp Card (Lane, 2021b). Completion of the rally earns Art Plaque item rewards.

In addition to collecting critters, fossils and artwork, players can also collect stamps on the Nook Miles app by performing various highly achievable tasks on the island. Successfully collecting these stamps will automatically reward players with Nook Miles, a mileage system that allows players to redeem items such as furniture and fashion items, as well as air tickets or boat trips to mystery islands. In short, the mechanism of collecting is a cyclic path. It begins with actions, then specific actions (of collecting) fulfil tasks, which translate to (the collection of) stamps and rewards, and the rewards can be used to redeem other collectibles or opportunities for more actions. From these examples, it is clear that the mechanism of collecting in ACNH is educational and thoroughly planned.

Apart from the endo-referenced creativity of the in-game museum and mechanism of collecting, exo-referenced creativity is also possible beyond-game in the real world. In a joint promotion with Nintendo, the Yokohama Hakkeijima Sea Paradise (2021) recreates the ACNH International Museum Day Stamp Rally for museum visitors to collect ACNH's character stamps, while also recreating a virtual version of the museum and souvenirs for Switch gamers to visit and download (Lane, 2021c). This is a convincing demonstration of how creative, educational ideas can cross the boundaries of virtuality and reality to be applied in both the virtual and the real world.

3.2.5 Ownership of Virtual Time & Game Pace

Despite all the incentives of performing the highly achievable tasks in ACNH, it is not obligatory for players to accomplish any of them to enjoy the game. There is no competition in the design of this game, so there is no failure. While time in ACNH's world is in sync with time in the real world, players have full control of the virtual time and game pace. This is made possible because players can time-travel back and forth to the past and future, and there is virtually no timed task that must be fulfilled before a player can proceed with the game. Players can freely interact with items or villagers on the island, time-travel to a date to enjoy a missed event, or completely ignore everything and simply spend the day sitting at the beach, listening to the sound of ocean waves. Therefore, if a DGBL activity is created in ACNH, learners will also enjoy full control of virtual time and game pace.

Overall, ACNH offers great freedom of creativity for players to establish identity/individuality, has unbounded creativity potential for development beyond-game. In terms of target audience, ACNH is suitable for all ages, implements flexible mechanism of sharing and collecting for tasks in-game and beyond-game, and permits ownership of virtual time and game pace. Therefore, ACNH can safely pass the Stage 2 filter on game design.

3.3 Stage 3 Filter – Game Support

3.3.1 Longevity

Given that ACNH has only been published two years ago and is highly popular worldwide (see sections 4.3.2 and 4.3.3), it may be a safe choice for teachers to build their lessons around this game while the materials may still be reusable many years later.

3.3.2 Social Connectivity/Interactivity

Swartout and van Lent (2003, p. 34) describes that a good digital game should be “highly interactive, deliberately generating tension between the degree of control the story imposes and the player’s freedom of interaction.” ACNH is one such game, because the story does not impose much control on the players, players enjoy great degree of freedom of interaction in-game and beyond-game. There are four game modes that allow multiple players to play the game at the same time, namely, multiplayer, party play, local play, and online play, allowing a maximum number of eight players to play on the same island at once (Stow, 2021).

Additionally, players can also make use of the Nook Link app, a mobile app that connects the virtual world and real life, to send text messages or voice chat with another player without exchanging phone numbers while playing ACNH together (Spear, 2021). Via these modes of communication, social connectivity/interactions between (internet) friends and family members are made possible. Nicolas Vignolles, head of the association of French video game publisher association SELL, praises ACNH as “an ideal game for parent-child interaction” (France 24, 2021) while Aya Kyogoku, a Nintendo game manager/producer/director of every Animal Crossing game since 2003, considers ACNH “a communication game” that she hopes “people will play with family and friends, having fun across generations” (McDonald, 2020). ACNH producer Hisashi Nogami also hopes that “a lot of the Animal Crossing fans will use this as an escape, so they can enjoy themselves during this difficult time” (Webster, 2020). From these examples, it is evident that ACNH is well-designed for social connectivity/interactivity.

3.3.3 Community Support

In the case of ACNH, Nintendo has even embedded the concept of community support into the game mechanics through its ACNH Custom Designs Portal, allowing custom designs to be searched, downloaded, created in-game by players and then shared via social media platforms such as Twitter, YouTube, and Instagram. There are also numerous ACNH communities beyond-game [e.g., Nook’s

Island (n.d.), Animal Crossing World (n.d.), subreddit NoFeeAC (Tait, 2020)] and can be easily found using internet search engines. Therefore, ACNH has a very strong community support and can safely pass the Stage 3 filter on game support, which means that ACNH qualifies as a DGBL-friendly game after successfully passing through the three-stage filtration system for the selection of DGBL-friendly games.

4. Pros and cons of Using ACNH: A Selected Digital Game for DGBL

ACNH is a way to hang out, connect with and even make friends from all over the world amid lockdowns and social distancing. (Ruby, year 3 undergraduate student, Hong Kong)

ACNH is a way to kill time when we are stuck at home during the pandemic, it is a source of peace and positive emotions to the players when the social atmosphere was gloomy and suffocating. (Kiki, Master's degree holder, United Kingdom)

ACNH as a selected digital game for DGBL has important benefits for both educators and learners. For example, it can be considered “gameful” – a term coined by game designer and researcher Jane McGonigal (2011) for a digital game that can “create platforms and experiences that empower players to have the spirit of the gamer in real life” such that the game can be life-changing, reality-changing, game-changing, and world-changing. Chris Comerford (2020a), principal researcher of the Animal Crossing Research Project and lecturer at the University of Wollongong, describes the game as,

a platform for routine substitution and social connectivity in a disconnected physical world. A combination of the game's elements, including its comforting aesthetic, participatory community, financial mechanics, and goal-setting, promotes the player's construction of their sense of self and provides crucial stability.

Similarly, news editor Imad Khan (2020) from the New York Times, calls ACNH “the Game for the Coronavirus Moment”, as “Animal Crossing offers a haven and can give players a feeling of empowerment and community, particularly at a moment when many are being told to stay at home”. His colleague and pop culture reporter Kyle Buchanan (2020), sees ACNH as the “perfect way to spend quarantine” because the “new Switch video game offers a candy-colored substitute for real life”.

In a study conducted by the Oxford Internet Institute on video gaming and wellbeing, a total of 2,756 players of ACNH reported feeling significantly happier than those who do not play the game (Kleinman, 2020; University of Oxford, 2020). The evidence shows that ACNH indeed has significant positive impact on its players around the world, has a gameful design, and has been rated as DGBL-friendly after passing through the three-stage filtration system.

In terms of educational implications of ACNH, the student gamers/YouTubers agree that DGBL teachers of various subjects can find benefits in the game.

Biology: The nature. Introduction to animals belonging to different phylum through Critterpedia. ACNH allows us to know more about the flora and fauna in the natural world. As city dwellers, we seldom have access to the information. There wasn't a Chinese version for the games before ACNH, and that's how we learned the English of 'cicada', e.g. (Ruby, year 3 undergraduate student, Hong Kong)

Culture and history: The reflection of different cultures from the design of villagers and their interior decorations. For example, Genji with Japanese-style interior; Pekoe with Chinese-style interior; Klaus with Greek-style interior. The world heritage through Gulliver's series. Festivities and celebrations from different parts of the world. (Kiki, Master's degree holder, United Kingdom)

Visual arts: Redd's paintings and sculptures could be useful in introducing students to the famous and classical pieces of art. (Kiki, Master's degree holder, United Kingdom)

However, new DGBL teachers may face several difficulties when utilising ACNH in DGBL, including long preparation time, cost of Nintendo Switch and ACNH game, maximum number of players allowed per island, and distraction from learning.

It can be very time-consuming to prepare the necessary set-up. The game itself wasn't intended for teaching, although it could be a useful tool to assist teaching. It would require a lot of time to farm objects/items in the game. The console and the game are not something that families can easily afford, which can be a discrimination/barrier for learning. (Kiki, Master's degree holder, United Kingdom)

The game cannot host more than 8 players at a time on an island, which means for classes of a bigger size, compromises will have to be made, e.g., they will have to split into groups. It may be hard for students to concentrate/not be distracted by other more exciting game features. (Ruby, year 3 undergraduate student, Hong Kong)

Nevertheless, through careful planning, ACNH would still be a very good option to support DGBL.

If the game is utilised within its capability, the game would be useful in arousing students' interests in learning, increasing interactivity, as well as reinforcing and consolidating points that have been introduced. As long as it isn't too heavily relied on transmitting knowledge as normal classes are supposed to, the game would be a great addition to teaching. (Kiki, Master's degree holder, United Kingdom)

5. Conclusion

DGBL has the potential to become an important pedagogical approach for a variety of subjects and fields. However, new teachers have not received adequate easy-to-grasp information or practical suggestions from the existing academic literature. This current paper has thus proposed a three-stage filtration system as an applicable, low cost-high return, low barrier-to-entry game selection framework to assist teachers with their DGBL teaching. The system consists of three filters: game acceptance, game design, and game support as stages for identification, screening, and inclusion processes respectively. Drawing evidence from relevant literature, I have explained the meaning of constructs in each filter. I have also demonstrated the implementation of the three-stage filtration system for the selection of DGBL-friendly games via ACNH. Simultaneously, ample examples have been provided to showcase creative ways of utilizing ACNH, with the hope of generating new ideas for DGBL teachers. To ensure extensive coverage of views and opinions from a broad spectrum of stakeholders., I have incorporated academic research, game reviews, and excerpts from virtual interviews conducted with experienced ACNH student gamers/YouTubers.

This paper contributes to real-world applications in a number of ways. Firstly, the proposed three-stage filtration system for the selection of DGBL-friendly games is relatively simple to understand and apply, requiring no prior knowledge in any theoretical concepts in education or experience in gaming to begin the game search. Secondly, the cost of time and effort is low as this framework filters out less desirable digital games quickly in each stage, saving teachers valuable time from unnecessary searching. Thirdly, this paper provides a range of creative examples and ideas showing how a well-selected DGBL-friendly game could be integrated into lessons. Limited by the space and mode of this paper, I cannot convey, even the slightest of, how extraordinary these examples are through texts. Readers are strongly advised to experience the possibilities and potential through the web addresses in the reference list below.

Lastly, a limitation of this framework is the lack of empirical verification of how constructs are connected. Currently, the constructs in each stage filter are considered equal in weight. This is highly unlikely in reality, however. Future empirical research may apply statistical techniques (e.g., partial

least squares structural equation modeling, see Law and Fong, 2020) to measure the relationships and strengths between constructs and obtain a clearer picture. Researchers may also consider comparing the DGBL-friendliness of two or more digital games quantitatively in future work.

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