Vernacular Digital Games as English Language Learning Tools: An Exploratory Study in the Syrian Context

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\square ABSTRACT \square

The popularity of Vernacular or Commercial-off-the-Shelf games in Syria is a given. This research is the first step to harness and utilize the affordances of such games in English language learning. To this end, an exploratory questionnaire was devised to collect data about the gaming habits of a group of Syrians and to explore whether digital games are positively perceived as instrumental in the development of English language. It particularly sheds light on the players' self-reported interactions during and around the game, their progression throughout the game, their opinions about the ideal combination of multimedia elements games should afford. The research finally invites their suggestions as to how to maximize the efficacy of digital games in English language learning. In sum, participants particularly stressed the importance of structuring spaces for language use as precondition to progressing in a vernacular game, without compromising the entertainment that characterizes such game genre.

Keywords: vernacular digital games, flow theory, edutainment, challenge-skill dynamic

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الألعاب الإلكترونية الرائجة كأدوات لتعلم اللغة الإنكليزية: دراسة استكشافية في السياق السوري

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□ ملخّص □

إن شعبية الألعاب الإلكترونية الرائجة في الأسواق أمر مسلم به. يشكل هذا البحث خطوة أولى لتسخير واستثمار مزايا تلك الألعاب في تعلم اللغة الانكليزية. لهذه الغاية تم تصميم استبيان استكشافي لجمع البيانات عن عادات اللعب لمجموعة من السوريين واستكشاف فيما إذا كان ينظر إلى هذه الألعاب إيجابيا كوسيلة نافعة لتطوير اللغة الإنكليزية. يلقي الضوء بالأخص على ما يرويه اللاعبون عن تفاعلاتهم أثناء و حول اللعب، على تقدمهم أثناء اللعب، و على آرائهم فيما يخص الدمج الأمثل لمكونات الوسائط المتعددة الذي ينبغي على الألعاب أن تتيحها. ينتهي الاستبيان أخيرا بدعوة المشاركين لاقتراحات من شأنها أن تأخذ فاعلية الألعاب الإلكترونية في تعلم اللغة الإنكليزية إلى الحد الأقصى. بالخلاصة أكد المشاركون بالأخص على بناء مساحات لاستخدام اللغة كشرط مسبق للتقدم في لعبة رائجة من دون المساومة على الترفيه الذي يميز هذا الصنف من الألعاب.

الكلمات المفتاحية: الألعاب الإلكترونية الرائجة، نظرية الانسيابية، الترفيه التربوي، ديناميكية التحدي-المهارة

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Introduction:

Ownership of mobile phones is increasing exponentially in Syria, even among school children. Similarly, digital gaming consoles are quite common. The pervasiveness of such tools and the popularity of digital gaming is a given. Rather than challenging digital gaming, this paper explores how to maximally utilize its potential for language learning and teaching in Syria. It starts by reviewing the literature related to digital gaming in language teaching and learning then presents a small-scale study in the Syrian context, describes the research findings and outlines future research directions.

Literature Review:

Before introducing the argument for the utility of commercial digital games in language learning and teaching in the Syrian educational context, some distinctions need to be made for the sake of conceptual clarity. Regarding the type of game, vernacular or commercial off-the-shelf (COTS) games are designed for entertainment; serious games are designed purposefully for L2 learning and pedagogy (L2LP). (Godwin-Jones, 2014: 11; Reinhardt & Sykes, 2012: 32). The term "digital game" is not uniform but rather further defined by the genre (action, sports, strategy, simulation, role play, etc.), player configuration (solo, multiplayer, massively multiplayer), and player in-built extent of engagement among other aspects. The structure, tasks, intensity and content of games also vary: games can, for instance, revolve around problem solving, establishing communities (The Sims), or fighting wars (Call of Duty) (Gee 2017: 29). Prensky coins the term "complex games" and sets it in contrast with the less intense mini-games. Complex games are characterized by leveling up, adaptivity and worthwhile goals (2005: 25). The terms complex games, vernacular games, and commercial-off-the shelf games will be used interchangeably throughout this article.

Another conceptual difference is that between game-based learning and gamification (Werbach & Hunter, 2012; Morschheuser et al. 2017). Gamification is a tradition already practiced in some Syrian classrooms. It is evident in rewarding students, setting challenging tasks, creating quizzes and leadership boards, among other elements, mechanics and dynamics of gaming — all these dimensions are usually added to conventional classes in order to heighten students' engagement. The significance of this study is in promoting a move from gamification, i.e. adding a gaming layer to a nongaming context, to adding an educational layer to digital gaming contexts. Advantages of using digital games for English language learning cannot be claimed without firstly specifying the game genre and the gaming context. Ideally however, vernacular games have affordances that can be summed up in the following paragraphs.

1. Informal Language Learning:

One of the repeatedly cited merits of digital games is the extensive use of, and intensive exposure to, the target language (Godwin-Jones, 2014: 10). Undeniably exposure can sometimes lead to addiction, yet it is replete with opportunities for incidental learning. Serendipitous or incidental learning takes place because of players' motivation and the array of resources on offer in vernacular games (Reinders, 2012: 38). Not only is informal learning important for an enhanced language learning experience outside classroom boundaries, it is also outreach tool. Outreach is an urgent need in the Syrian educational context in order to include children residing in remote areas and those who had interruptions from schools.

2. The Linguistic Dimension:

Language development occurs as a result of in-game and around-the-game interactions among players within the same physical space or among those who are dispersed geographically but share the same online forum. Vernacular games afford language development as explained next.

2.1. In-Game interactions: Active and Meaningful Use of the Target Language:

The linguistic input in a game comes from a variety of sources including in-game voice-overs, verbal clues, conversations, signs, feedback, and walkthroughs. Simply defined, walkthroughs are "instructions on various elements of gameplay in relation to specific digital games, and exist as text-based documents and, to a lesser extent, as recorded moving image game footage" (Ashton and Newman, 2011: 4). In the case of vernacular games, input is likely to be multimodal: visual, audio and textual. As such, interaction can be oral, in response to, or in the form of, speech input. Multimodal input and access to native language is a need in the Syrian educational context where English is not a second, but a foreign language.

Making sense of instructions and feedback is intrinsic to gameplay and is driven by the continued interest to progress in a game (Hamari et al. 2016: 170). Some vernacular games do not only necessitate linguistic comprehension for progression throughout the game, but they also require responses, sometimes through producing a contextually appropriate language. Another way of practicing the language is "repeating the language used in voice-overs and by in-game characters" (Reinhardt & Sykes, 2012: 36).

2.2. In-Game Interaction: Recursive Use of the Target Language:

By interacting with game objects and characters, gamers have to use meaningful language, then re-use it in different contexts with elevated levels challenge and complexity. Such cyclic use can lead to "reinforcement of earlier introduced vocabulary and language structures" (Godwin-Jones, 2014: 10).

.2.3. Around-the-Game Interaction: Virtual Affinity Spaces and Pluriligualism:

Pluriligualism is the competence of performing effectively in intercultural communities drawing on multilingual repertoires, including the mother tongue. Pluriligualism stresses that an individual's multiple linguistic repertoires are intimately linked and that boundaries among languages are blurred during use (Álvarez & Pérez-Cavana, 2015: 60-63). It does not, however, mean perfect command of several languages. The use of "plurilingual commentary" has been highlighted as a linguistic advantage in some studies on digital gaming (Reinhardt & Sykes, 2012: 36). Such commentary may well take place in online forums where players co-operate to solve a problem or understand a task related to a shared game they are playing. Gamers can interact both online and in shared physical spaces. Together, these spaces are "affinity spaces" defined as a "whole set of physical and virtual space (and the physical and digital routes among them) that characterize the comings and goings of gamers with a shared affinity" (Gee, 2017: 29).

.2.4. Around-the-Game Interaction: Physical Affinity Spaces:

In addition to exchanging experiences in online forums, players' physical co-presence and negotiation of the meanings of game instructions or feedback – even in native language – is another type of around-the-game interaction. Learning also happens through "watching the other play" (Reinhardt & Sykes, 2012: 36).

.3. The Affective Dimension:

.3.1. Self-Tailored Progression:

A well-designed digital game matches the challenge to the player's skills. In other words, they are adaptive to every individual player's proficiency level in a way that sustains the momentum of gameplay. Such affordance of "individualized customization" or "keeping pace with the learner's growing ability" (Hamari *et al.* 2016: 177) is hardly attainable in the Syrian classroom where large numbers of students and time restrictions hinder teachers from providing progressive personalized monitoring for every learner. Automatic adaptivity to a player's abilities is a key feature of complex or vernacular games. In a sense, adaptivity means creating a "flow zone", a "narrow zone between things being too hard ("I give up") and things being too easy ("I'm not challenged at all")" (Prensky, 2005: 26). An appropriate level of challenge is also a precondition for engagement which, in turn, is essential for learning as will be next detailed.

.3.2. Engagement:

Hamari *et al.* (2016) contend that an appropriate challenge has a direct and mediated effect on perceived learning. Mediation happens through heightened engagement where engagement or game flow is achieved through concentration, interest and enjoyment. Concentration is the depth of cognitive processing; interest stems from intrinsic motivation and stimulates continued engagement; and enjoyment refers to the positive feelings enhanced by demonstration of skills (172, 175). Interest in or passion for a game drives learners to affinity spaces where game-related interactions take place (Gee, 2017: 29). Moreover, computer-generated feedback is less inhibiting than feedback in a face-to-face setting where error can cause embarrassment and lead to giving up.

.4. The Technological Dimension:

Transparency of tools also seems an intriguing reason to call for the integration of digital games in language learning. Today's youth are digital natives who intuitively use technological devices, which makes it easier to focus on educational goals than simply tool use. Additionally, as previously mentioned, digital games afford multimedia learning, depending on their design sophistication. According to dual coding theory (Paivio, 1986), information which is received in different modes, i.e. verbal and non-verbal, is stored in independent yet interrelated channels (visual and textual). A multimodal experience reinforces learning and recall due to the mnemonic power of imagery. That said, such channels have limited processing capacity that can be overburdened. For instance, in what is known as the "modality effect", it is concluded that together with pictures, accompanying words are better narrated than presented as on-screen text since on-screen presentations of words are stored in the visual memory and may well result in cognitive overload (Mayer & Moreno, 2003: 46). This point shapes the questionnaire item which explores the combination of multimedia elements – images, video, audio, text, music -that participants deem ideal for learning. This question only touches on preferences and perceptions; future research needs to delve deeper into this question based on the actual performances of players as these combinations of multimedia elements vary.

.5. Challenges of Using Vernacular Digital Games:

Having listed the potential benefits of using vernacular digital games as far as language learning is concerned, it must be noted that playing such games might have adverse effects on other aspects of a player's life. Addiction, exposure to violent or inappropriate

language, cultural stereotyping and health risks are all commonly cited disadvantages of gaming. However, here lies the role of research in raising awareness and harnessing the challenges. As Tobias et al. put it, "if games can teach knowledge, skills, and attitudes that transfer from games to everyday life, it seems reasonable to expect that both anti-social and pro-social behaviors practiced in games transfer to non-game contexts" (2015: 6).

The Research:

.1. The Research Questions:

- 1. Do participants play digital games? If so, what are their gaming habits?
- 2. Do they play in English? If yes, what are the perceived advantages of gaming in terms of language learning?
- 3. What is the potential of digital games in language learning and teaching from the participants' points of view?

.2. Sampling and Data Collection:

The target population was my FaceBook friends since the research is exploratory in nature and aims to describe the status quo of gaming as self-reported by volunteering participants. A digital questionnaire was created as a Google document, and a link was posted on my FaceBook page so that any willing FB friend could access it and fill it in at their convenience. Such sample is referred to as a non-probability or convenience sample. Non-probability samples "occur when either the probability that every unit or respondent included in the sample cannot be determined, or it is left up to each individual to choose to participate in the survey." (Fielding et al., 2008: 199). However, as Fielding et al. add, such sampling is not just for the sake of convenience, it is instrumental in formulating hypotheses and "identifying issues" (ibid. 199-200), which is the concern of this research. The total number of respondents was 38. Analysis of the questionnaire shows that respondents were Syrian university students, school students, graduates, lecturers, teachers, engineers, doctors, among others. Their fuller profiles are described in the analysis section. Optimally, the research should have targeted a specific group of participants; however, the concern here was to include as many responses as possible as a first step towards more informed future selections.

The questionnaire comprised four main sections. Section one aimed at delineating the participants' profiles by gathering demographic information such as gender, age, and educational status. Section two is mainly concerned with the participants' gaming habits: whether they play digital games, whether they interact with other players, whether the game is online or downloaded, what types of games they mostly play, what devices they use to play, how much time they spend playing, and what language the game they play is in. Section three focuses on the participants' perceptions of the educational value of digital games in terms of language learning or any other learning benefits. It also investigates the participants' opinions of the best combination of multimedia elements an ideal game can offer. The section concludes with an open-ended question that invites the participants to suggest the qualities that make digital games ideal for language learning.

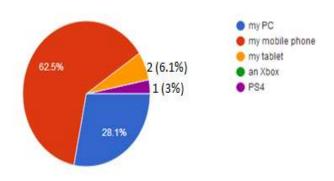
.3. Data Analysis and Discussion:

.3.1. Participants' Profiles and Gaming Habits:

The participants' ages ranged between 18-46: approximately 50% were 26-28. Their educational backgrounds vary as described above. The data shows that 63.2% of the respondents were male and 36.2% were female. The majority (86.8%) played digital games

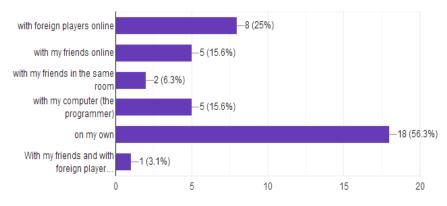
and the remaining participants who did not, provided the following reasons for abandoning gaming: lack of interest, lack of time (one respondent considered games a waste of time), incompatibility of outmoded mobile phone, and perceived negative psychological influence of gaming: "it [playing digital games] makes me aggressive" (Participant 19).

Regarding the types of games participants played, action and adventure games topped the list as they were opted by nearly half of the respondents, followed by puzzles, simulations (or role-play) and serious educational games, fighting, virtual reality, fantasy, while racing came at the bottom. One respondent added the category "strategic games". The device most frequently used is a mobile phone as the chart clarifies.



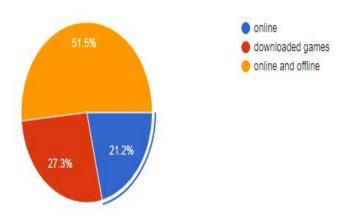
(Chart 1: The Device/s Participants Use for Gaming)

Interestingly, more than half of the respondents played games on their own, making it plausible to assume that interaction with the game itself was the most compelling type of interaction for them. Interaction around the game leaned towards interaction online rather than in the same physical space. This raises the question of whether or not gaming encourages isolation.



(Chart 2: Self-Reported Interactions)

Limited interaction online may be attributed to limited accessibility although fast Internet connections are available nowadays, which was implied in the fact that only 27.3% of the respondents played "downloaded games" only.



(Chart3: reported habit of gameplay: online or offline)

The majority of participants (94%) stated that the language of the game they played most frequently was either English only or English and Arabic; none played games that contained no language. It is safe to assume that exposure to English language is then one of the spin-offs of gaming. This is particularly true given the daily frequency of play. The duration of exposure was reasonable: only 12.1% reported playing for more than three hours a day while 57.6% of the respondents played less than an hour a day.

.3.2. Perceived utility of games in language learning:

Moreover, there was almost a consensus among participants that gaming improved their language skills. Perceived improvements were reported especially in the domain of vocabulary learning followed by speaking as chart 3 shows.

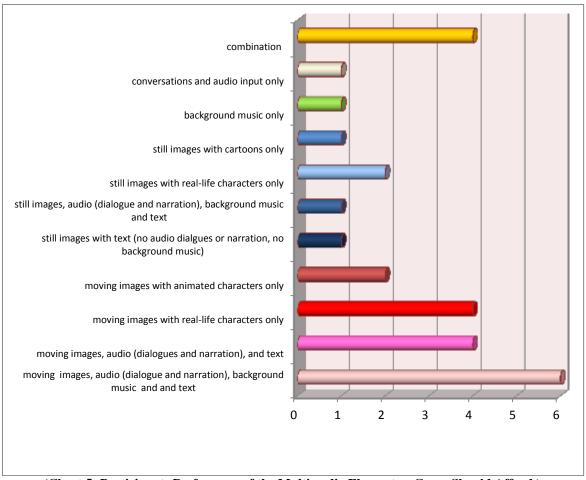


(Chart4: Perceived Improvements in English Language Skills)

In addition to language, other types of knowledge and skills were reportedly gained as a result of gameplay. These were mainly cultural awareness, problem solving (reported by 58.1% of respondents each) and increased computing proficiency (45.2%). Mastering a multitude of novel skills and strategies and applying them to "dozens of ever-harder" and more advanced levels are properties of complex games, as Prensky notes (2005: 25). Games that promote such skills as problem-solving and higher-order thinking are also referred to as 21st century competency games (Jan & Gaydos, 2016:7).

In answer to the question of how respondents progressed in a game when its language was English, 17 respondents stated that they depended on "visual feedback", 17 read and understood the language – instructions, conversations, titles, feedback, etc -- of the game using a dictionary or searching the net. Nine participants relied on both visual feedback and non-human aid. Asking another player or a non-player for clarification of the meanings of unfamiliar words was opted by only one participant each. These numbers imply that players either did not want to interrupt the flow of the game, unless at their own pace, or that they tended more towards interaction with the game artifacts than with other players as previously concluded. This was, to some extent, further corroborated by the tendency to consider "a challenging quest" as the most motivating aspect of playing according to 57.6% of participants, followed by "quality of the game's graphics and sounds" (36.4%), "competition" with friends (27.3%), the game's feedback (21.3%) and teacher's feedback (12.1%). In sum, the inherent features of the game – in-built challenge and multimedia quality – were given more weight than assistance from an informed other, so to speak. Depending on visual feedback gives further prominence to the importance of inserting linguistically driven tasks as participants themselves suggest in the open-ended section of the questionnaire. Further, the fact that a "challenging quest" took precedence over other items echoes other research findings that specify challenge as a major predictor of learning (Hamari et al., 2018:170).

Finally, when asked to indicate what, if any, combinations of multimedia elements -moving images, still images (real-life characters, cartoon), audio, background music, and
text-- they preferred to experience in a game, most participants favoured a combination,
mainly of moving images, audio, background music and text. One participant stressed the
game's narrative by choosing the category "other" and reversing the order of the question:
rather than selecting a game with any combination of elements s/he wrote "story
containing games with dialogues and subtitles". Another participant opted "moving
images, audio and text" but added that "text should not be overloaded – only instructions"
making an implicit reference to the burden that processing longer texts can add to the
working visual memory. It is over-simplistic to answer the question of the best
combination of multimedia elements based purely on perceptions. The fact that 4
participants selected a "combination" without specifying which combination made it hard
to conclude an answer here. Longitudinal observation of gameplay, pre- and post-game
testing and follow-up interviews can yield deeper data. Although beyond the scope of this
study, this avenue remains a fertile ground future research.



(Chart 5: Participants Preferences of the Multimedia Elements a Game Should Afford)

.3.3. Potential of Digital Games in Language Learning: Reinforcement of Linguistic Elements:

The open-ended question of the questionnaire yielded some interesting insights into what makes a digital game apt for language learning. Overall, participants accentuated the need for a game to provide structured language learning opportunities while preserving the qualities of a vernacular game such as enjoyment and design sophistication, as will be next detailed. 18 respondents expressed the need for reinforcing the linguistic focus in a digital game. To achieve this, the following suggestions were made.

.3.3.1. Reinforcement of Linguistic Elements: Emphasis on the Storyline Rather than Gameplay Itself:

18 respondents underlined the importance of the linguistic content of games, stating that a player should not be able to skip to a new quest without comprehending "the story of the game" (Participant17). In other words, understanding "the conversation" should be a precondition to completing a quest. "Providing audio scripts for the conversations taking place throughout the game" (Participant 31) was suggested as one way to ensure comprehension of the language of the game. Another participant proposed that progress in the game should be punctuated by linguistically rich tasks: riddles or whatever conditions to move to next levels are loaded with linguistic elements that the player needs to analyze, decipher and understand to be able to continue (Participant 26).

.3.3.2. Reinforcement of Linguistic Elements: Iterative Use of Clear Language:

The responses also stressed the importance of recursive use of the language (Participant 11) as well as the provision of "unified language throughout the game" (Participant 22) so as to enable familiarity with the linguistic feature that a game introduces. Additionally, comprehensible language, including the language of instructions, facilitates navigation of the game – which is likely to maintain motivation:

Using clear and simple language (vocabulary, sentence...), so the player can find his/her way through the game, without struggling with language. (Participant 22)

.3.3.3. Reinforcement of Linguistic Elements: Need for Spoken and "Real" Language:

A recurrent preference expressed by participants was for digital games to afford verbal interaction by enabling "open communication" (Participant 6), "microphone share" (Participant 23) and interaction with the game:

A speaking part be added where the player is asked to verbally interact with the game in order to solve the challenges offered. (Participant 34)

Free chat and deviation from routine tasks are seen to enhance motivation (Jan & Gaydos, 2016: 7).

Additionally, games should reflect the "real-life situations" encountered outside the domain of playing, according to a number of responses (Participant 32, Participant 27 & Participant 28). "authentic contexts with genuine problems" cultivate the player's higher-order thinking and social skills (Jan & Gaydon, 2016: 7).

Recommendations concerning the cultural implications of the game's language also reflect the importance players attach to the content of the game and the relevance of its values to their real lives:

The language used in the game should be appropriate and respectful of other cultures so that the player would not feel offended for example while playing Counter Strike the Arab player would definitely notice the stereotyped image of Arab people as terrorists. Thus cultural issues should be taken into consideration while integrating such games in language learning. (Participant 31)

The incorporation of cultural discourse and narratives makes vernacular games apt for developing "critical cultural awareness", which is part and parcel of language learning (Reinhardt & Sykes, 2012: 35). The above excerpt shows that participants can be sensitive to cultural misconceptions and stereotypes and conscious of the importance of abandoning games that promote them.

.3.3.4. Reinforcement of Linguistic Elements: Need for Mediating Language Aids:

Not dismissing the role of context in understanding new vocabulary, some respondents were in favour of providing applications that aid language development:

I suggest adding both English/English and English/Arabic dictionaries to the games. Although the player might understand most new words through the context, sometimes there are key words which can be really difficult to guess and the player, that's why having a dictionary would help players understand and learn more information about the new words. (Participant 36)

any game should have simplified instructions available with sounds and images to help students. (Participant 33)

players should be well guided to practice different language skills. (Participant 37)

This is in line with the literature which advocates the positive impact of add-ons with linguistic focus (e.g. bilingual dictionary) (Reinhardt & Sykes, 2012: 37) and appropriate scaffolds and support (e.g. clues, resources, etc.)" (Hamari et al. 2016: 177). Although incidental learning or learning "in the wild" (Reinhardt & Sykes, 2012: 38) is an advantage of gameplay, pedagogical mediation seems to be still desirable. Vygotsky defines a Zone of Proximal Development (ZPD) as

the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peer. (1978: 86)

In this study, it may be safe to conclude that the gaming space provides a ZPD through interaction with gaming objects rather than more capable others. This was manifest in the respondents' reference to dictionaries and simplified instructions as sources for guided participation in the open-ended question, which further strengthens the previous conclusion that they preferred resorting to a dictionary, the Internet, or visual feedback to asking help from others.

Overall, participants voiced a clear need for language-rich opportunities to mediate play. On the other hand, they deemed essential both enjoyment and multimedia sophistication, which are key characteristics of a vernacular digital game.

.3.3.5. Focus on the Entertainment Side of "Edutainment": Enjoyment:

Despite the focus on language learning that respondents expressed, there was a trend to consider "pleasure" and "interest" equally important. This is in harmony with the flow theory that considers elevated enjoyment and interest as key constructs of the flow experience (Hamari et al. 2015: 172). Words and phrases such as "pleasure", "interest", "boring", "rigid", "losing interest", "stop playing" recur in some answers to the open-ended question. Enjoyment which is interpreted as the display of competencies and creative accomplishment (ibid.) is also lucidly expressed in the phrases "let the player find it on his/her way" and "rules could be ... hidden in each level in a secret place which students have to look for while playing." The fuller extracts where participants emphasized the importance of enjoyment and interest are:

It [a game] should be designed for pleasure before anything else without being rigid and boring because the latter might lead to students losing interest and stop playing. (Participant 33)

Trying not to present a direct linguistic tip or hint (let the player find it on his/her way)... We are not in academy! We are learning through playing (Participant 22)

The rule or rules behind correcting or writing could be embedded or hidden in each level in a secret place which students have to look for while playing (Participant 33)

Indeed, "authentic learning assessment embedded within the tasks that promote reflection" is one of the features of "authentic edutainment environments" that advanced learning technologies enable (Shadiev et al. 2018: 111).

.3.3.6. Focus on the Entertainment Side of "Edutainment": Multimedia Sophistication:

Not only did participants implicitly imply that a multimodal experience underpins an ideal learning environment (through expressing the need for games to enable open communication and mimick real life complexity and scenarios), they also expressed this explicitly:

Using high quality graphics and sounds (low quality games will be abandoned)

Using a combination of text, sounds, images...(multimedia), and never rely on one element, so the player can construct the concepts appropriately, using that language (Participant 22)

The second excerpt takes the discussion back to the inextricable bond between education and entertainment: a multimodal experience heightens engagement and fosters understanding of complex or abstract concepts that are hard to convey through textual information single-handedly.

Limitations and Directions for Future Research:

This study is a small-scale tentative exploration of perceptions regarding the utility of digital games in language learning in the Syrian context. It sheds light on how entertainment tools can be utilized as educational tools in an era where technology is a given. In the future, methodological rigor can be further achieved by incorporating other data collection methods such as longitudinal observation of game logs and gameplay and pre- and post- game testing in a more specific context using a specific game genre. The focus can be on language learning during play rather than perceptions only. Initially, proposing re-purposing and harnessing vernacular games for learning is more realistic than suggesting designing games from scratch. The immediate aim of this descriptive-exploratory study was to get a feel of the characteristics of digital games that are beneficial for language learning. Yet, the ultimate aim is to produce such games that foster the concept of edutainment in the long run, especially in relation to the Syrian student's specific learning needs.

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