Bridging learning and play: the digital game experience

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Abstract:

Digital games provide rich environments where players can experiment choice, expression, creativity, success, or failure. In the last decade, digital games have been used to enhance learning settings both in school and in the workplace. However, Digital Educational Games (DEGs) have not matched the massive success of Entertaining Games (EGs). Both educational and entertainment games are constructed on set of rules that give players the opportunity to try new things, to develop strategies, and to be entertained by the play experience. What make EGs so successful among players? How should DEGs be constructed, in order to attract and engage players? How can fun and learning be balanced when constructing a DEGs? Should humour and curiosity be used as key motivational triggers? The authors address these questions and provide insights into the design challenges and the development processes of a DEG for foreign language learning.

Keywords: game mechanics, Pokemon GO, Tingo

1. Introduction

Goals, objects, rules, actions, play spaces, and players are considered the key elements of play design [1]. Understanding the relationship between game mechanics, dynamics, and player experience, as well as mastering what constitutes an optimal blend of these elements remains a challenge, especially when designing Digital Educational Games (DEGs) that focus on achieving specific learning objectives [2].

Entertaining Games (EGs) provide valuable insights on how to construct successful game goals [3], such as

- designer-centric goals: make money, become famous, activate in a community, express yourself, make the world a better place, etc. or

- player-centric goals: make the game fun, make the game challenging, expose players to structured conflicts, enhance the players' capabilities to make decisions, enhance player's understanding of specific concepts, issues, etc.

The wide range of goals that can be targeted in a game proves that games can be incredibly diverse. Even if efforts have been made to deconstruct EGs to support DEG design and development, such researches do not reflect the fact that game design processes and

prototypes can result in breakable systems, unnecessary materials, ambiguities, and imbalances [4] that need to be settled in order to obtain a releasable and hopefully a successful game. However, these researches have consolidated the knowledge base supporting the design of successful DEGs and have provided insights on how to construct games that can motivate and engage players.

This paper explores the lessons that can be learnt from EGs and that can be applied in DEGs on key game mechanics. The research explored how game rules can be presented to players in order to enable them understand the meaning of explicit, implicit, discoverable, and hidden rules. The authors have carried out a case study on the Pokemon GO game and have discussed how the key game mechanics that have been identified were applied in the design of the Tingo DEG that supports the learning of foreign languages.

2. Game Mechanics in Entertainment Games: Lessons learnt from Pokemon GO

The research has focused on extracting key game mechanics in Pokemon GO, in order to fundament the design of the Tingo DEG. The following mechanics have been selected as relevant:

- *Reference 1: Providing assistance*. Professor Willow guides players throughout the game, providing essential information to support progress and resource collection. For example, on Level 5, Professor Willow provides information to help players choose a team out of the three teams proposed by the game: Valor, Instinct, and Mystic.
- *Reference 2: Collecting resources*. The goal of the game is to catch as many pokemons as possible.
- *Reference 3: Receiving bonuses*. For each pokemon caught, the players receive a set of resources, which it is coupled with his performance in the game. For example,
    - The player will receive a curveball bonus if he manages to spin a Poke ball and throw it with a curve.
    - When a player catches a pokemon that has never been caught before, he will receive a bonus of 500 XP.

Figure 1. The evolution of the PIKACHU pokemon

Figure 1. The evolution of the Buterfree Pokemon

- *Reference 4: Enhancing resources*. The player has the opportunity to enhance his resources. To evolve a pokemon caught in the wild in Stage 1, the player must use candy. There are pokemons that can evolve only once (from Stage 1 to Stage 2: Mankey =>

Primeape; Growthlithe => Arcanine), and there are pokemons that can evolve twice (from Stage 1 to Stage 2 to Stage Stage 3: Squirtle => Wartortle => Blastoise; Caterpie => Metapod => Butterfree).

Figure 3. Pokemon GO teams: Valor, Instinct, and Mystic

- *Reference 5: Defining action zones*.
    - *Pokestops*. Pokestops are areas where players can collects various items (e.g. eggs, Poke Balls) that can help them capture pokemons.
    - *The Gym*. To locate a gym, the players must walk through the physical world. To enter a gym, the player must have reached level 5. Players can choose between three teams: Valor (red), Instinct (yellow), and Mystic (blue).

3. Constructing the Tingo Game

Building upon the case study carried out on the Pokemon GO game, the design of the Tingo DEG has considered the key game mechanics that have been identified to consolidate the user experience.

Pokemon GO mechanics	*Tingo mechanics*
Reference 1: Providing assistance.	Tingo is the key character of the game that assists the players during learning experiences, enabling them to understand the game rationale and tackle the challenges.
Reference 2: Collecting resources.	Players can collect points and game items after successfully completing tasks within the game.
Reference 3: Receiving bonuses.	To stimulate players to achieve learning objectives, the game includes bonus rewards.
Reference 4: Enhancing resources.	To receive information from Tingo, the player needs to collect resources to keep him active. The game also integrate a social component that enables players to share set of resources among each other, in order to progress in the game.
Reference 5: Defining action zones.	The game includes key areas that the player can explore in order to advance in the game or collect points, items, and bonuses.

The main areas of the game are: the residential area; the office area; the school; the park; the police office; the fire station; the airport; the train station; the harbour; the beach. The player

experience starts in the residential area. As the player progresses in the game, he can access quests associated with other areas.

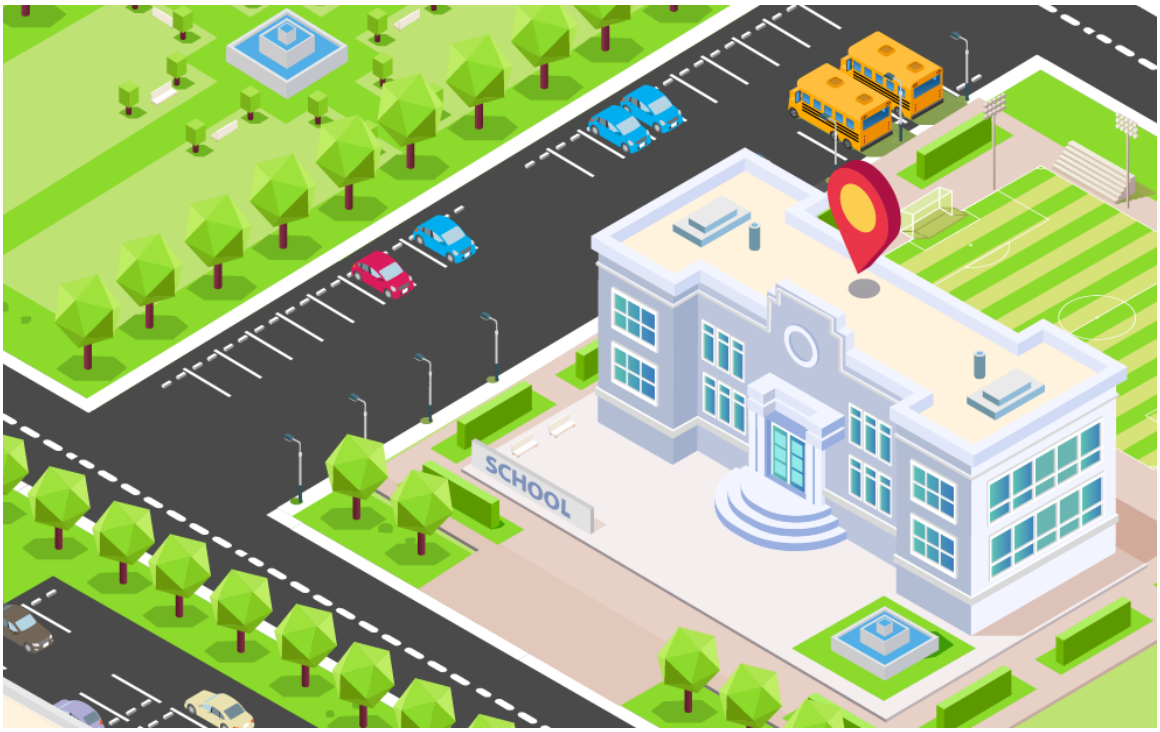

Figure 4. The School area

In order to consolidate engagement and motivation, the core principle behind the design of the learning activities was diversity. The game integrates various activities, such as:

- The game presents variants for the translation of a word, and the player must click/ tap on the correct answer.
- The game presents a set of items from a certain category (home, office, garden, supermarket, park, etc.), and the player must choose / write / associate the correct translation for each of the items shown in the scene.
- The game presents several options for a grammatical form (ie. the plural of nouns; the comparison of the adjective, regular and irregular verbs, etc.), and the player must select the correct answer.
- The game presents a group of objects, and the player must choose similar words or opposites.
- The game presents a description of a context, and the player must fill in the missing words in a text.

Figure 5. Validation of the answers given by a player

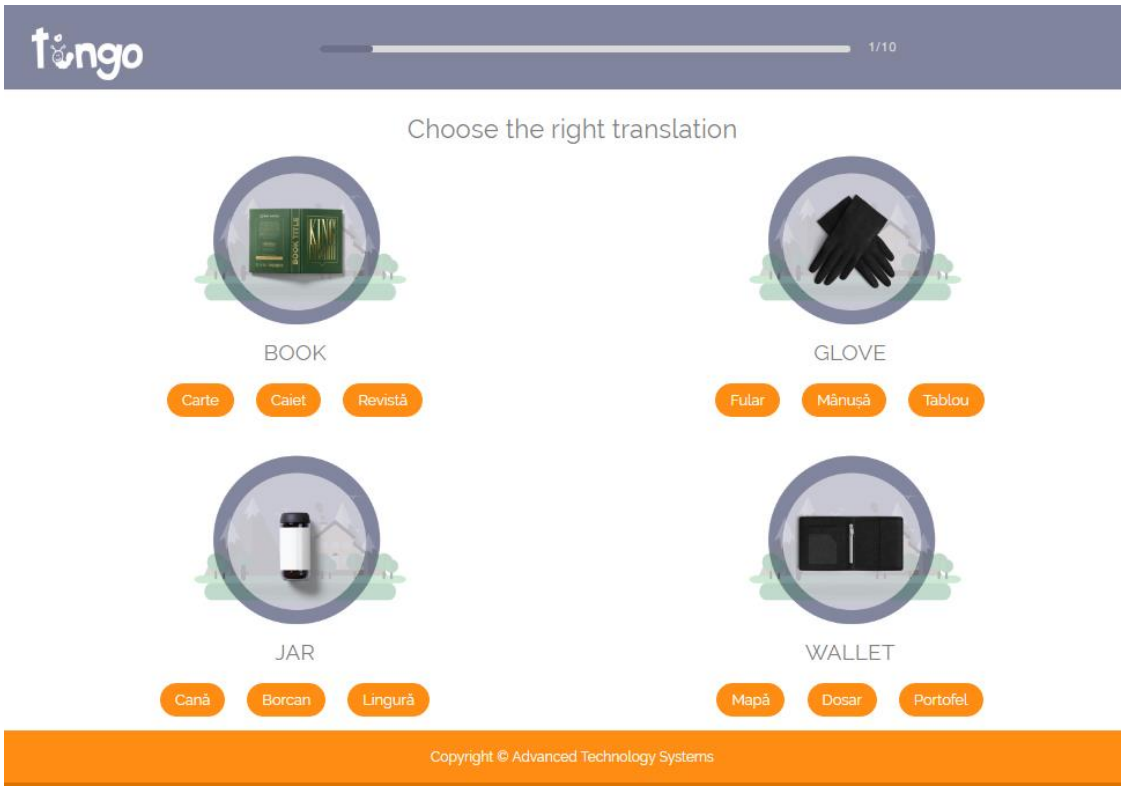

Figure 6. Choosing the right answer

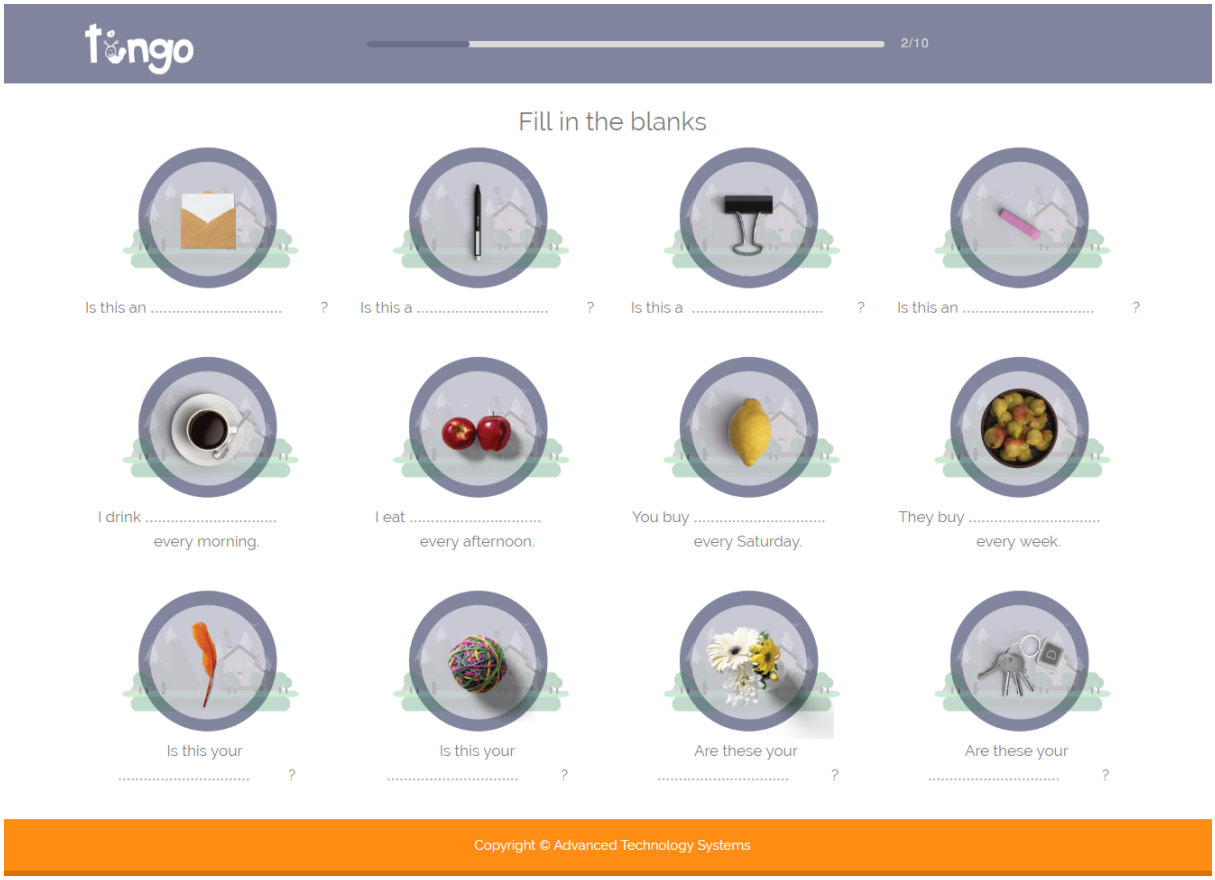

Figure 7. Fill in the blanks

Humour has always played a significant role in building interesting learning experiences. The integration of funny objects, funny characters, jokes, etc. into the Tingo game enables designers to reduce the stress that is associated with learning activities and create additional motivational stimuli for players to advance in the game to discover new fun elements.

Figure 8. Using humour as learning stimuli

4. Conclusions

DEGs are interactive systems of rules that players engage with in order to experience a specific kind of learning [5]. Since DEGs have not reached the massive success of EGs, finding means to improve DEG design remains an open challenge. This paper presents a case study on the Pokemon GO game with the purpose of identifying key game mechanics that can be used to enhance the player experience in DEGs. The work has focused on integrating the Pokemon GO mechanics into the Tingo educational game and future research considers analysing the impact of these mechanics on the success of the Tingo game among players.

References

1. Macklin, C., Sharp, J. (2016). Games, Design and Play: A Detailed Approach to Iterative Game Design. Addison-Wesley Professional.
2. Carvalho, M. B., Bellotti, F., Berta, R., De Gloria, A., Islas Sedano, C., Baalsrud Hauge, J., Hu, J., Rauterberg, M. (2015). An activity theory-based model for serious games analysis and conceptual design, Computers & Education, Volume 87, Pages 166-181, ISSN 0360-1315, http://dx.doi.org/10.1016/j.compedu.2015.03.023.
3. Bond, J. G. (2017). Introduction to Game Design, Prototyping, and Development: From Concept to Playable Game with Unity and C#, Addison-Wesley Professional.
4. Hiwiller, Z. (2015). Players Making Decisions: Game Design Essentials and the Art of Understanding Your Players, New Riders.
5. Burgun, K. (2015). Clockwork Game Design, Focal Press.