Birds of Paradise: A Game on Urban Bird Biodiversity Conservation

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Abstract: Birds of Paradise is a mobile game that aims to raise awareness of urban bird biodiversity. Due to a disconnect with nature, humans are becoming more indifferent to biodiversity, including urban bird biodiversity. This disconnect leads humans to take part in activities that harm biodiversity. The researchers believe that through educating the players on different bird species and the importance of green spaces, the game can aid environmental literacy specifically on urban bird biodiversity conservation. The 2D collecting game Birds of Paradise is developed for Android mobile devices where players get to build their own green space, play a minigame, and complete missions, all of which will help the player learn more about urban birds.

Keywords: Mobile Game, anchored instruction, game-based learning, urban bird biodiversity, bird biodiversity conservation

1. Introduction

The Philippines has a rich avifaunal diversity and houses more than 600 different resident and migrating bird species with new bird species still being discovered to this day. One third of these bird species are endemic to the Philippines. The bird population of the Philippines makes up around 6% of the world's total bird population; however, one third of the bird species that can be found in the Philippines are threatened, and these numbers are on the rise. This negative trend on birds is caused by several pressures, the majority being human activities such as deforestation, mishandling, and pollution (Panopio & Pajaro, 2014). Due to a disconnect with nature, humans are becoming indifferent to biodiversity and this disconnect leads humans to take part in human activities that harm the bird population (Miller, 2005).

One way to alleviate this disconnect is to spread environmental literacy, through the media or academe (Bickford et al., 2012). Hence, the researchers aim to develop a game that informs the players on how to help conserve birds in the urban landscape. By creating a game that is both informative and fun, the researchers believe that this can help spread environmental literacy specifically on urban bird biodiversity conservation.

Birds play an important role in the ecosystem. They are responsible for pest control, pollination, and other key activities that bring balance to the ecosystem (CGTN America, 2015). Due to this, it is important to protect bird species from various threats. A key challenge in wildlife conservation is the undervaluation of species (Belgrado, 2020). Through this study, the group aims to spread awareness on different bird species and the importance of green spaces. By educating the player on the aforementioned topics, the game aims to encourage players to value bird conservation.

2. Review of Related Literature

The goal of this research is to develop a game that can be used to educate and raise awareness on urban bird biodiversity conservation. In this chapter, the researchers explore how games can be used to educate using concepts such as Game-based Learning (GBL) and Anchored Instruction.

GBL is a type of gameplay with a defined learning outcome. GBLs are designed to balance gameplay with learning to help the player retain information from the game and apply it to the real

world (EdTechReview, 2013). Games implementing the GBL technological paradigm have been shown to have positive effects on a student's motivation and engagement. Motivation pertains to the student's desire for learning and engagement is about the attention a student puts into whatever he/she is doing. Results of the research conducted by Serrano (2019) on students in elementary to high school level show that students have given positive feedback regarding GBL. Moreover, for a game to produce a positive effect on learning and engagement it is recommended by Schifter (2013) to have (1) Goal Orientedness, (2) Meaningful Interactions, (3) Engaging Narrative, (4) "Hero" Player, and (5) Eye-catching Visuals. Hence, to ensure that the game will be engaging and have a positive effect on learning, the researchers will apply the aforementioned characteristics.

Anchored Instruction focuses on using a type of media material to anchor the user to learning by solving complex, realistic problems (InstructionalDesign.org, 2018). The anchor in anchored instruction is the "scenario or situation given to learners that sets the stage or provides the context for use of learners' knowledge or skills" (Glazer, 2014). Kariuki and Duran (2004) conducted research on anchored instruction wherein they used it to teach preservice teachers to integrate technology in the curriculum. The teachers used the educational computing class to record their experiences in the development class. The curriculum development class theme was used as the "anchor" for the educational computing class. The result of the research showed positive results in the preservice teachers' learning. Given the effectiveness of GBL, the group will develop a game about urban bird biodiversity using the two principles of anchored instruction. The game will serve as the "anchor" for urban bird biodiversity learning. It will simulate real-life scenarios on creating green spaces and make the player identify the relationship of the birds to certain amenities. The game itself is interactive and will allow the player to explore the topic as long as it is within the scope.

3. Methodology

Since the main goal of the game is to inform by spreading awareness on urban bird biodiversity in the National Capital Region (NCR), Philippines, the group consulted subject matter experts who are knowledgeable on bird diversity and green spaces. This helped the researchers ideate and create a game that is as accurate as possible.

Birds of Paradise is a 2D bird collecting game, developed in Unity 2019.4.13f1 for Android devices, that aims to spread awareness on urban bird biodiversity. The player will be tasked to place amenities in their green space to attract birds. The main objective of the player will be to complete the bird catalog through discovering new birds. To do so, the player must place amenities in his/her green space as specific amenities attract specific birds. The game will also feature a mission system which encourages game progression. Asides from the main objective, the game will feature a minigame to test the player on their knowledge of the birds.

In order for the game to be engaging, it will be designed to cater to the behaviorism learning aspect of GBL. Since behaviorism is about learning through simulation and reinforcement, the game will have elements to represent this in specific features of the game. The three aspects of the game that would be modeled for a behaviorism approach would be as follows:

- Game Rules - The rules of the game are straightforward, no hidden mechanics or rules that need to be read in-between the lines.
- Gameplay - The game will implement a mission system to stimulate the player into achieving goals.
- Game Narratives - The game narratives would not be too information heavy. The player will learn more through the minigames and core gameplay.

In order to test the effectiveness of the game, the researcher conducted 2 rounds of user testing with 5 adult (18 years old and above) testers per round. The testing was remote and unmoderated where testers were given two questionnaires (pre-test and post-test) to answer. The questionnaires contain 4 main sections, 2 of which are similar in both the pre-test and post-test questionnaire. The two similar sections in both pre-test and post-test questionnaires are the learning effect section, which aims to measure the knowledge of the tester on urban bird biodiversity and green spaces, and the attitude effect section, which aims to measure the attitude of the tester towards urban bird biodiversity conservation.

The tester was tested before and after playing the game then the results were compared to see whether or not the game has a positive, negative, or no effect on the tester.

4. Conclusion

After conducting the testing, the researchers conclude that GBL can help aid the disconnect between humans and nature. The participants were able to retain information about the different bird species present in NCR and were also more familiarized with the concept of green spaces. Furthermore, the participants reported an overall positive game experience. Participants were able to immerse and challenge themselves with the game. Most importantly, participant's attitude towards urban bird biodiversity conservation improved. Participants were able to become more aware of the issues within urban bird conservation. The game that was developed by the researchers did not only focus on informing the player about urban bird biodiversity and green spaces but they also made sure that the game is both eye-catching and easy to use so that the player could focus on the learning aspect of the game.

Acknowledgements

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