Abstract

Games are by their nature interactive, informative and developmental and in many cases full of fun and entertainment. SAAO has used modern and indigenous games to communicate astronomy to learners, educators and members of the public. These games include board, card, stone, pen and paper, domino, singalongs, ball and computer games. The use of games serves to simplify, demystify and communicate hard concepts in a fun way. They extend beyond the confines of institutions as games can be played at home and school. There is also no need for supervision when rules are mastered. This presentation also examines the principles (racing, collection, simulation and placing) which underpin our games as well seeking to demonstrate how simple materials can be transformed into communication and educational tools by infusing relevant astronomical knowledge.

Introduction

Our country is facing a huge challenge in communicating science. There is an even harder challenge in dealing with astronomy communication and education because of the peculiar history of astronomy in South Africa. Modern astronomy in our country is inextricably linked with the beginning of colonialism; astronomy was not even part of the school curriculum prior to 1995. Astronomy was only offered at postgraduate level in some universities and the isolation of our country from the world also affected astronomy as a field of study.

The introduction of democracy concomitantly with the building of the Southern African Large Telescope has changed the landscape positively. The bidding for the Square Kilometer Array Telescope has put astronomy on the public agenda. The launching of Sunsat, a South African microsatellite as well as the soon-to-be launched Sumbandilasat satellite has generated interest in astronomy and space science. Mark Shuttleworth’s space tour and the development of science centres have raised people’s interest in astronomy. SAAO facilitates a number of events such as workshops, tours, exhibitions, star parties and public lectures as part of communication strategy. Games are one of the ways of communicating astronomy.

Motivation for using games

Games are a form of edutainment as they bring enjoyment to the players while also ensuring the transfer of knowledge and information. Games simplify, demystify and communicate hard concepts in a hard way. They extend beyond the confines of institutions and there is no need for supervision when the rules are mastered. Games also create a platform of interaction among
players of different ages, experiences and levels of knowledge and understanding. They can also be used to challenge misconceptions, preconceptions as well as alternative conceptions. Games can cover one concept as well as introduce new concepts to players.

Different types of games

Board games: There are quite number of these games. We have used South African designed games such as the Solar System game, Space Trek, planet games as well ASP’s Moon Chase.

Observational games: Isilemela, a game named after the Pleiades and usually played by Xhosa and Ndebele initiates undergoing the circumcision tradition of manhood. Constellations, is a game based on a challenge to try to identify the various constellations in the night sky.

Card games: Cosmic Decoders; Astrobingo.

Physical games: Shadows, this is a game that can be played during solar-based activities and when introducing sundials. In this game participants have to predict the length and positions of shadows and draw them using chalk. The exciting part is to compare the size and position of shadows at different times as well as during different seasons.

Stone games: These are indigenous games that have been infused with astronomy knowledge. Puca is a girls’ stone game that has been adapted by painting the stones different colours to represent the different colours and temperatures of stars. Nkwenkwezi, is a boys’ game based on a Xhosa idiom that “as above so below”, this is an observatory building game in which participants use stones aligned to constellations on the ground.

Pen and paper games: These are suitable for adult and teenage learners and demand some basic astronomy knowledge. The rules of the game can be changed by the participants to make the games more challenging and interesting. We have also used puzzles with great success, especially with the younger learners as they particularly enjoy them.
We have also explored domino games such as the Moon Phase game, computer games, singalong games and ball games.

**Principles of Design**

Like all games, astronomy-based games make use of the principles of racing, simulation, placing, collection and battling. The strategy is to infuse astronomy knowledge into already existing games. The familiarity with the rules of the game makes it easier for the participants to play and to focus their attention on the new content.

**Challenges**

Most of the board and card games are in English and this has been a challenge for young learners whose first language is not English. Lack of understanding of astronomy concepts can be an obstacle, as some games demand a certain level of knowledge. The changing nature of astronomy knowledge means that the games have to be adapted to any revisions, e.g. the reclassification of Pluto. Computer games prove to be a challenge to those who lack basic computer literacy. Contextual issues such as culture, availability of resources and nature of players (age, grade and homogeneity of group) also need to be taken into account in selecting and playing the games.

**Conclusion**

Games can be used as an introduction of new concepts or consolidation of understanding. If used as an introduction, there needs to be a follow-up activity such as stargazing or a hands-on activity. Games have to be part of a variety of approaches for maximum impact.