DHI CASE STORY

EXPLORING THE WORLD OF AQUA REPUBLICA

Using serious gaming to improve water resource management

Countries around the world grapple with how to manage and share limited water resources. To help encourage sustainable water management, we developed a unique, not-for-profit serious game: Aqua Republica. While the world of Aqua Republica is fictitious, the water management challenges are real. The game utilises real world data to present participants with real life water management scenarios. Aqua Republica helps participants learn about the connection between and importance of water resources. In doing so, the game enables participants to gain hands on experience of integrated water resource management (IWRM).

INNOVATIVE TEACHING OF SUSTAINABLE WATER MANAGEMENT

The long-term viability of environmental resources and social and economic development require sustainable water management. Balancing growing water needs with a limited water supply, however, is a challenge many countries around the world face. Often a single water resource has multiple users and uses. Decisions taken by one user may have far-reaching effects elsewhere. As such, effectively managing water can be a complex process.

To help promote sustainable water resource management through knowledge sharing, we developed Aqua Republica. A serious game created in collaboration with the UNEP-DHI Centre, Aqua Republica:

- allows anyone interested in sustainable development to practice making decisions on a basin level
- raises awareness of issues in water management
- builds capacity in some of the most critical issues in water resources management

Available for free online at www.aquarepublica.com, our interactive game helps participants learn water management best practices both in their region and around the world.

REAL WORLD-BASED SCENARIOS

To create the game, we combined scientific models with game mechanics to develop an online virtual world. The game's backbone is our MIKE BASIN software, which we combined with real world data to generate a realistic basin environment. We then integrated social and economic factors and real life scenarios into the game.

SUMMARY

PARTNER

United Nations Environment Programme-DHI Centre (UNEP-DHI Centre)

CHALLENGE

- Promoting best practices and key issues in managing water resources
- Educating stakeholders and future generations about sustainable water resources management
- Testing and developing innovative ways to promote learning to existing and new audiences

SOLUTION

Interactive serious game that reflects the real world difficulties and challenges of water management

VALUE

- Increased awareness of water management issues through hands on experience
- Effective dissemination of information and best practices related to problems in water management

LOCATION / COUNTRY

Global

The game layer also consists of a reward system that encourages players to learn through competition and positive actions. For example, a player who takes care of the ecosystem while developing a catchment gets bonus points and a positive event. A player who refuses to take the state of the ecosystem into account, however, will encounter pollution events. This requires the player to use more resources to clean it up, which ultimately results in a lower score. At the end of the game, the player with the higher score can be said to have performed closer to the best practices of managing water.

Screenshot of Aqua Republica's interface. © DHI

UNEP-DHI ECO CHALLENGE

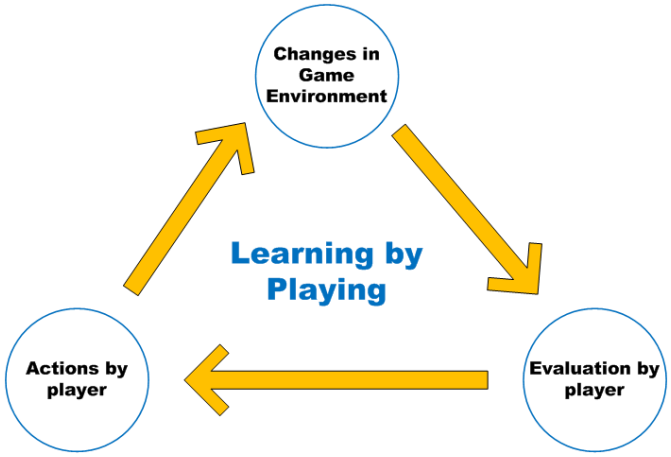
In Asia, we ran the UNEP-DHI Eco Challenge in conjunction with the Serious Games Association Singapore and the Hong Kong Digital Game-based Learning Association. As an alternative to traditional classroom-based teaching, teams from India, Hong Kong, Singapore and Thailand competed against each other in the world of Aqua Republica. Each team consisted of three students (ranging from 13-16 years old) supervised by a teacher from their respective school.

Students participating in the UNEP-DHI Eco Challenge in Chiang Mai. © College of Arts, Media and Technology

Over the course of the three-day online competition, the students' scores increased. This indicated that they improved their knowledge of sustainable water management. Aqua Republica's flexible learning environment was the key factor in this. Our game helped participants understand the conflicts and trade-offs that exists in a water catchment. It enabled them to recognise the:

- needs and perspectives of all the stakeholders in IWRM
- connectivity and importance of water resources
- value of ecosystems
- benefits of applying ecosystem-based approaches to IWRM

Since the competition ended, the participants have conducted further research on the principles of IWRM.



The cycle of learning by playing utilised by Aqua Republica. © DHI

CUSTOMISABLE TO YOUR UNIQUE SITUATION

Based on your specific needs, we can customise Aqua Republica to take into account different geographical locations, water data, scenarios and learning goals. The UNEP-DHI Eco Challenge, for example, ran our first customised version of the game. It focused on raising awareness of sustainable water management among students.

We are also developing other customised versions of the game, including:

- a high school version with training materials, in conjunction with Cap-Net UNDP– an international network focused on sustainable water management capacity building as part of the United Nations Development Programme
- a version for stakeholders in South Africa's Middle Olifants Catchment, in conjunction with the German Federal Ministry of Education and Research

CLIENT TESTIMONIAL

"Aqua Republica has provided the Centre with a new and exciting opportunity to both broaden its horizons in terms of potential target audiences and increase the volume and scope of training activities. We are already working closely with DHI's Serious Game Unit to consider how we can take our new ideas even further."
Gareth James Lloyd —Senior Advisor —UNEP-DHI Centre

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