Plan for the GUPES Challenge 2016

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UNEP-DHI PARTNERSHIP
Centre on Water and Environment

UNEP DHI

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Contents

Background

21st century learners are increasingly embracing the dramatic shift that has come with technology advancements. One such example is in digital games, which are now becoming widely accepted as serious learning and assessment tools. This is in stark contrast to the past, where educators were more hesitant to use computer games in the classroom. The use of games in learning activities, or game-based learning has also been proven to be more fun, engaging and strengthens skills important for collaboration, problem-solving, and communication.

In embracing these new technological trends, Aqua Republica, a DHI and UNEP-DHI strategic browser based game, helps raise awareness and educates users of the importance and challenges of managing limited natural resources in the face of competing demands. The aim of the game is to raise awareness of the importance of sustainably developing, managing and using natural resources, as well as how this can be achieved in the field of water resources. The game is best suited to users from age 15 years upwards. More information on Aqua Republica can be found in Annex 1.

Global Universities Partnership on Environment and Sustainability (GUPES) is an interactive international network of over 680 affiliated universities, which has the aim of promoting the integration of environment and sustainability concerns into teaching, research, community engagement, and management of universities. GUPES has a strong interest in innovative environmental education and views Aqua Republica as a way of enhancing student engagement and participation in sustainability activities both within and beyond universities. This will be achieved by using the Aqua Republica game in a competition setting as a platform to engage with undergraduates with an interest in natural resource management. The competition will be called the GUPES Challenge.

The GUPES Challenge concept is based on the successful UNEP-DHI Eco Challenge and DWA[1] Challenge Competition, where teams of older high school students compete with one another in playing the Aqua Republica game. The UNEP-DHI Eco Challenge Competition started in 2013 and more than 4000 students from Hong Kong, Vietnam, Japan, Singapore, Indonesia, Philippines, Thailand, New Zealand, China, South Korea and Australia have now participated in what has become an annual event. The DWA Challenge Competition is a similar event but with teams of undergraduate university students competing in playing the game. Both series of events have not only proven to increase interest in environment and water management among the participants, but also helped promote stewardship of water resources and have encouraged the development of critical thinking, multi-stakeholders problem solving and decision making skills.

[1] DWA is the German Association for Water, Wastewater and Waste

Objective

The aim of the GUPES Challenge is to use Aqua Republica to educate undergraduates about the importance and interconnectivity of water and environment, as well as how it can be more sustainably managed.

Expected Outcomes

- Foster a desire in students to learn more about water resources and environmental management and equip students with the knowledge and skills needed to apply the basic principles of integrated water resources management
- Promote practical environmental stewardship thinking, by showing that working with freshwater ecosystems is about more than protecting intrinsic values
- Encourage the development of serious games and game-based learning activities in universities to enhance and promote learning
- Promotion of GUPES

Target audience

The target audience of the challenge are undergraduate students of the partner universities of GUPES.

Partners

GUPES: The Global Universities Partnership on Environment for Sustainability (GUPES), is one of the flagship programmes of UNEP's Environmental Education and Training Unit (EETU). GUPES was the result of a consultative forum organized by UNEP and its partners, to deliberate on ways of escalating UNEP's engagement with universities. It builds on the successes of the Mainstreaming Environment and Sustainability in African Universities (MESA), the nascent Mainstreaming Environment and Sustainability in the Caribbean Universities (MESCA) and the Asia-Pacific Regional University Consortium (RUC).

UNEP: The United Nations Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and serves as an authoritative advocate for the global environment.

UNEP-DHI Partnership: The UNEP-DHI Partnership – Centre on Water and Environment (UNEP-DHI) is a United Nations Environment Programme (UNEP) centre of expertise supported by the Danish Ministry of Foreign Affairs, dedicated to improving the management, development and use of freshwater resources from the local to the global level.

GUPES Challenge Plan 2016

The GUPES Challenge competition FOR 2016 will utilizes the latest unique version of the Aqua Republica game by UNEP-DHI. While there is interest in making this an annual event, the plan is to pilot the competition in 2016 and evaluate the experiences and lessons learnt, before taking a decision on whether and how to move forwards. For 2016 a total of 15-25 universities from 6 regions will be invited to participate. The regions are Africa, Asia, West Asia, Europe North America and Latin America.

Target number of students and countries: The target for 2016 will be to get at least 3,200 students to participate in the competition within the GUPES network.

Timing and pilot competition: The competition in 2016 will start in June and end in August 2016.

Winners/Certificates: There will be a top three GUPES winners in the competition (1st, 2nd and 3rd). Emphasis will also be placed on acknowledging both the winning teams and their universities. A special certificate will be awarded to the university that has the most participating students. Winning teams and universities will be presented with a certificate from GUPES, UNEP and UNEP-DHI at the GUPES meeting at MIT in September 2016. However, funding is not provided for travel by UNEP, UNEP-DHI or GUPES, and would therefore be expected to be covered by the winning teams' universities. In the event that the winners are unable to attend. Certificates will be sent to them via their universities.

Evaluation of the GUPES Challenge competition: An end-term evaluation involving GUPES members, UNEP and UNEP-DHI will consider the various strengths and weaknesses of the experiences in 2016, as well as how opportunities might be further exploited. This end-term evaluation could be held in conjunction with the annual meeting with GUPES network in MIT in September 2016.

World Environment Day Event 2016

In addition to the above there will be a separate GUPES Challenge event at Tongji University for 200-300 students in conjunction with World Environment Day on/around June 5th 2016 [details to be discussed and agreed between Tongji University, UNEP and UNEP-DHI].

Budget

The GUPES challenge runs on a voluntary/in-kind basis, whereby those involved provide their own time, expertise and resources without compensation, but with due recognition in promotional materials, awards, news articles etc.

Roles and responsibilities

UNEP-DHI Role and Support

Role

Responsible for oversight of the competition development, including organization, overall technical responsibility for executing the competition and working in close collaboration with the GUPES Focal Points.

Support

UNEP-DHI will provide the following to support country organisers at no cost:

- Aqua Republica game for use during the competition period in English
- Technical documents on the game for challenge organisers and teachers in English
- Web-based training on how to use the game in classrooms in English (this can also be done by supporting partners)
- Assistance with organising the competition such as
    - coordinating competition schedules
    - providing guidelines for competition
    - survey templates for teachers and students
    - invitation letter template for schools
    - certificate template for students
    - certificate template for schools
    - providing a common website for registration of the competition and consolidation of competition related news

GUPES Focal Points will have the role of executing the competition in collaboration with partner universities or directly with students. They are also responsible for:

- Establishing local partnerships if needed
- Inviting universities and students to participate in the competition
- Organising and running the competition
- Finding financing for the competition including prizes, printing of promotional materials, hire of any venues, etc. (either from own contributions or sponsors) (If needed)
- Collecting feedback from both students and professors or tutors

Competition Structure

The competition structure will be as follows:

- Each university will have a time slot of a week to play the game. Depending on the number of universities participating as well as the universities' schedule, it can be the same one week for all universities or different one week periods staggered over a period of 2-3 months.
- 3 students will form a team, preferably with a professor or tutor and register for the competition. The idea for have 3 students per team is to allow discussions among team members during the competition.
- After all the universities have participated and played*, the top 3 scores will be declared as winners of the GUPES Challenge

Outline competition rules can be found in Annex 2.

**Students will play Aqua Republica typically at their own university, either on their own or in a group.*

Work plan and timeline

Tasks	Responsible	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
Preparations								
Setup technical system for game and registration	UNEP-DHI							
Development of survey templates	UNEP-DHI							
Development of invitation letters and certificate templates	UNEP-DHI & GUPES							
Update Aqua Republica web for GUPES Challenge, including setting up analytics and marketing of the competition	UNEP-DHI							
Server set up	UNEP-DHI							
Server rental	UNEP-DHI							
Training co-organisers and partners to use registration system and control panel	UNEP-DHI							
Coordinate with co-organisers on competition dates	UNEP-DHI, co-organisers							
Coordinate on competition oranisation	Co-organisers							
Competition								
Competition period	Co-organisers							
Support for co-organisers on game and registration system	UNEP-DHI, co-organisers							
Evaluation and reporting								
Collection of survey	UNEP-DHI, co-organisers							
Reporting and evaluation	ALL							

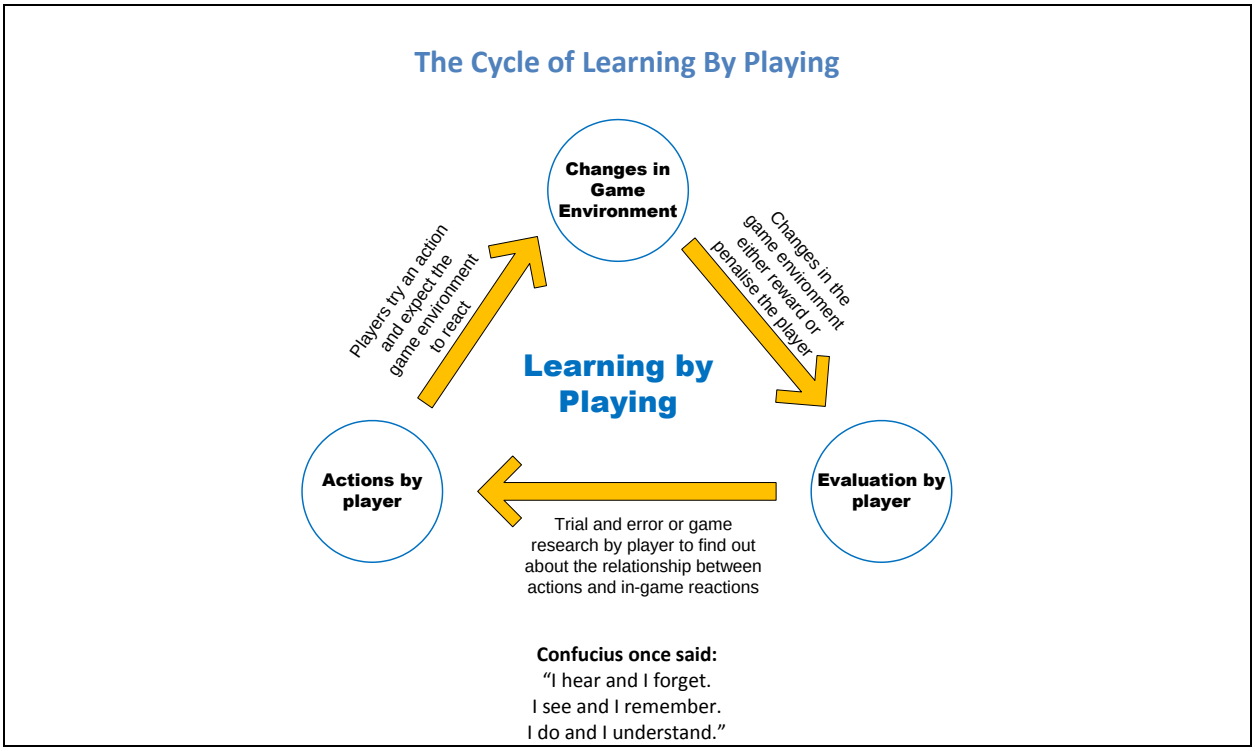
Annex 1 Additional information about Aqua Republica

Given the many uses of water in our homes for drinking, cooking and cleaning, as well as for producing food and energy, most people, regardless of where they live, understand its importance. But comparatively fewer people give much thought to the interconnectivity of water – how the many different uses and users directly and indirectly impact each other. And perhaps even fewer people appreciate how too little water or too much water or water of insufficient quality, can have a significant negative impact on economic and social development. At least until it is too late.

Unfortunately, supplies of water are generally becoming more limited, through a combination of increasing demands, poor management, and climate change, as well as degraded environments on which we depend for sustainable supply. By 2030 more than 1 billion more people globally will be trying to share the same amount of limited freshwater resources that we have today. Closer to home, we also have our challenges.

One of the first steps in addressing this situation is to raise people's level of awareness regarding both the importance and scale of the challenges, as well as how they can be addressed. An important part of this effort is to educate children, the decision-makers and action-takers of tomorrow. And this is where the value of serious games can be applied.

While serious games are meant to be entertaining, their primary use is for educational purposes. Serious games are typically embedded in a context based on real life and are designed to yield meaningful play. One aspect of serious games which can be particularly appealing to children is that they can facilitate a shift in the focus of control in learning from the teacher to the player and create an environment that stimulates self-learning, which can lead to greater knowledge retention.



While serious games are not new, there is a constant push to try to find new ways to make them more appealing and to expand their use. A major opportunity to accelerate progress in these areas is through the utilization of opportunities provided by advances in and dissemination of information and communications technology (ICT). Serious games making use of gaming environments are increasingly believed to be the classroom tools of the future, combining the developments in technology and the increased understanding of brain science, and particularly the role involvement in the learning outcomes.

The appreciation of these advancements in education and learning, as well as the opportunities in using ICT have been applied in development of a water management game called Aqua Republica.

Aqua Republica is a not-for-profit serious game produced by DHI and the UNEP-DHI Centre in close partnership with UNEP. The game combines DHI's technical competencies in development of water modelling software and knowledge of water challenges, with UNEP's interests in sustainable environmental management and can be played either online or offline. The rational for producing the game is to promote sustainable water resources management by sharing knowledge, raising awareness and building capacity in some of the most critical issues in water use and management. This is achieved through a computer-generated virtual environment ("Aqua Republica") where participants can experience making decisions in managing a catchment in an entertaining, interactive and engaging way. While the world of Aqua Republica is fictitious, the challenges of sustainably managing a limited supply of water resources in a situation of growing demand between multiple users and uses are very much based on real life scenarios.

Example Start Screen from a Version of Aqua Republica

The Aqua Republica is game software that is designed to be a powerful teaching tool, which uses a reward system to encourage learning and desirable behaviour. It is designed to engage people and increase both their knowledge and their interest in water-related issues. The ambition is to continuously develop Aqua Republica in multiple versions which have both broad and very specific appeal to a wide range of people and contexts.

The game goal in Aqua Republica is to achieve the highest score possible. This is achieved by employing a strategy which seeks to balance water consumption between different water users and uses, while caring for freshwater ecosystems which serve as sources of supply. The game, including the logic behind it, is built upon an engine that realistically simulates the flow of water in a catchment. This engine is used to support feedback to the player. For example, players are alerted if water use starts to become out of balance with demands or if supply is threatened. Players are also encouraged and guided towards appropriates types of remedial action.

Different versions of the game are developed to support different interests. For example, there are versions for stakeholder participation workshops based on specific geographical and hydrological data, and there are versions for raising awareness within certain sectors or business interests.

Annex 2 Competition Rules

This competition is only open to undergraduate students for the invited universities. The registration of the competition is handled by our GUPES focal points.

- Students are registered in teams of two
- Each team will have a login account which will be issued by the GUPES focal points
- Students will play in teams of two and compete at their own university/home or at a common venue with internet access and at their own time.
- Students should have access to the game for a period of up to 7 days and can play as many times as possible within the 7 days.
- Top 3 teams with the highest basin score for Mission One at the end of the university competition period will be university winners
- Top 3 teams with the highest basin score for Mission One among all universities at the end of August 2016 will be international winners.
- All decisions concerning winners will be made by UNEP-DHI and are final.

Prizes

- UNEP-DHI and GUPES will provide certificates for university winners and universities as well as certificates for international winners and universities.
- UNEP-DHI will provide a special award certificate will be given to the university that has the most participating students
- Universities can provide additional prizes for their own university winners.

Known issues of the game

- Multiple concurrent logins are possible. I.e. a player account can be used multiple times to play the game. This may create many connections and overload the server. Please note that participants will be disqualified if they log in multiple times concurrently.
- Time out problem. If a player starts playing the game and takes a long break (20 mins or more), then the game may time out and causes scores to not be recorded on the leader board. It is recommended that the player play the game in one session.
- The game is not supported in Chrome and is not playable on tablets (except Surface Pro running Windows OS)