



## Gamebrics Project Deliverable:

### Gamebrics products and how stakeholders can utilize them

<b>Deliverable Number</b>	D24	
<b>Deliverable Name</b>	Listing products for interested stakeholders (D24)	
<b>Work Package</b>	WP8: Sustainability	
<b>Delivery date</b>	<b>Planned:</b> 29-09-2023	<b>Actual:</b> 18-10-2023
<b>Version</b>	<b>Version:</b> 1.0	Concept <input type="checkbox"/> Definite <input checked="" type="checkbox"/>
<b>Authors</b>	Konstantinos Georgiadis (OW), Giel van Lankveld (OW), Hugo Hurdeman (OW)	
<b>Responsible person/Contact person</b>	Konstantinos Georgiadis (OW), Giel van Lankveld (OW), Hugo Hurdeman (OW)	
<b>Keywords</b>	Gamebrics outputs, stakeholders	

Gamebrics Project secretary: Open Universiteit Nederland  
Project leader and contact person: Dr. Hans Hummel, [hans.hummel@ou.nl](mailto:hans.hummel@ou.nl)

Gamebrics deliverables mogen vrij gebruikt worden onder [CC-BY](#) licentie (Creative Commons)

## Document revision log

Version	Date	Description	Author
0.1	07-12-2022	Initial stakeholder list based on Gamebrics project members	Giel van Lankveld (OW)
0.2	24-04-2023	1st draft of the stakeholder list for the Gamebrics project outputs	Konstantinos Georgiadis (OW)
0.3	11-07-2023	2 <sup>nd</sup> draft of the stakeholder list for the Gamebrics project outputs	Konstantinos Georgiadis (OW)
0.4	20-07-2023	3 <sup>RD</sup> draft of the of the stakeholder list for the Gamebrics project outputs after meeting with Hugo Huurdeman	Konstantinos Georgiadis (OW) and Hugo Huurdeman (OW)
0.9	06-10-2023	Pre-final draft	Konstantinos Georgiadis (OW)
1.0	18-10-2023	Distributed for last PT meeting, approved there, some final editing	Konstantinos Georgiadis, Hans Hummel (OW)



## TABLE OF CONTENTS

<b>Summary</b> .....	4
<b>Section 1: Mapping Gamebrics Output to Stakeholders</b> .....	5
Gamebrics Output.....	5
Functional Design Outputs .....	5
Interactive Tools.....	5
Working Examples and Demos .....	5
Validation and Evaluation Results .....	6
Stakeholders .....	6
<b>Section 2: On the Use of Gamebrics Outputs</b> .....	7
Teachers.....	7
Researchers.....	7
Education Coordinators .....	8
Serious Game Developers .....	8
ICT specialists .....	8
OU colleagues .....	8
General Public .....	8
<b>Section 3: Potential Future Stakeholders</b> .....	9

## Summary

The main goal of this deliverable is to provide a list of stakeholders that can utilize the Gamebrics project outputs, as well as descriptions on how these stakeholders can implement the Gamebrics project outputs in higher education. In specific, this document comprises of three sections that is: (1) an explicit mapping of the Gamebrics outputs to stakeholders, (2) descriptions on how the stakeholders can utilize the Gamebrics outputs, and (3) a list of potential future stakeholders that could make use of the Gamebrics outputs. It is written in English because the main author does not sufficiently master the Dutch language.

There are strong relations between this D24 with D18 (Disseminatieplan) en D23 (Duurzaam gebruik). In D18 the dissemination activities are mapped on main target groups, in D23 we provide more detail on the availability of project results after the project has ended.



## **Section 1: Mapping Gamebrics Output to Stakeholders**

This section describes how the Gamebrics project outputs map to the stakeholders (i.e., target groups) of the Gamebrics project. To achieve this, it is necessary to first define which are the Gamebrics outputs and the stakeholders.

### **Gamebrics Output**

The Gamebrics outputs can be categorized as follows: (a) functional design outputs including guidelines, (b) interactive tools, (c) working examples and demos, and (d) validation and evaluation results.

#### **Functional Design Outputs**

Considering the functional design outputs that includes a 1.0 version Functional Design Gamebrics Author (D1); that is an input environment developed with the Emergo game engine which can be used to develop Gamebrics compliant serious games, and a 2.0 version Functional Design Gamebrics Author (D5); that is a game type input tool that integrates an analytical rubric into scenario-driven gameplay for the acquisition of complex (analytical) vocational skills. In addition, it includes a series of guidelines and instructions such as: guidelines for elaborative reflective feedback (D3) which describe how to develop an analytical rubric for elaborate reflective feedback via a dashboard integrated within serious games developed in Emergo, instructions for using tooling by students and teachers (D11) which shows the instruction texts that students and teachers can use when learning to use the Gamebrics tools within Emergo serious games (and therefore also within the courses), and instructions for the use of Gamebrics tools within a course (D13) such as the Gamebrics Author (D21.1 and D21.2).

#### **Interactive Tools**

A set of interactive tools derive as Gamebrics project outputs, that is a Mock-up Gamebrics Dashboard (D4) which allows the visualization of the progress on the analytical rubric (as defined in D1 and D2) and the (reflective) feedback (as defined in D3), and a Gamebrics Author (D21.1 and D21.2) which makes possible for teacher and developers to add rubrics and associated scores to serious games themselves in a user-friendly way.

#### **Working Examples and Demos**

Several working examples (e.g., serious games) and relevant demos were developed to facilitate the application of Gamebrics outputs, such as the aforementioned interactive tools. More specifically, three Emergo serious games were used for the application of the Gamebrics project outputs, that is the "Kastenhoeve" which is a serious game on Management and Organisation, the "Junior Scientist" which is a serious game on consulting young researchers at various stages of the research cycle on statistics, and the "Edumyhbusters" which is a serious game that helps students to bust certain popular myths in Education (D7 and D8)

## Validation and Evaluation Results

Research outputs have emerged from the application and testing of the Gamebrics interactive tools on the developed working examples and demos. To this end, Gamebrics project outputs are also considered to be the 'full track' CETO application for ethical review within the Open University (D10), as well as the developed instruments for conducting the relevant research such as questionnaires (D12). In addition, a reporting of evaluation studies (D14) will be available. So far, a paper has been published at the CSEDU 2023 conference as part of the validation and evaluation outputs of the Gamebrics project.

## Stakeholders

As described in D18, the target groups defined in previous Gamebrics project meetings are: teachers, researchers, education coordinators, serious game developers, ICT specialists, Open University colleagues and finally the general public. An overview of the mapping between the Gamebrics project outputs to the stakeholders can be found in Table 1.

*Table 1. Mapping of Gamebrics project to stakeholders (note: mark x defines a mapping)*

<b>Gamebrics project outputs</b>	<b>Teachers</b>	<b>Researchers</b>	<b>Education Coordinators</b>	<b>Serious Game Developers</b>	<b>ICT specialists</b>	<b>OU Colleagues</b>	<b>General Public</b>
<b>1.0 version Functional Design (D1)</b>	x	x		x	x		
<b>2.0 version Functional Design (D5)</b>	x	x		x	x		
<b>Guidelines for reflective feedback (D3)</b>	x	x		x		x	
<b>Instructions for using dashboard (D11/13)</b>	x	x	x			x	
<b>Mock-up Gamebrics Dashboard (D4)</b>	x	x	x	x	x	x	x
<b>GB Author tool (D21/22)</b>	x	x	x			x	x
<b>Demo game (D7/8)</b>	x	x		x	x	x	
<b>Research setup (D10/12)</b>		x					
<b>Main findings studies (D14, D19)</b>	x	x	x	x	x	x	x



## Section 2: On the Use of Gamebrics Outputs

The outputs developed within the Gamebrics project will remain digitally freely accessible to the stakeholders for at least 5 years. The source code developed within this project will be shared via Open-Source license (BSD-3 license). The (functional or technical) documentation will become available: (a) for third parties within education under the Creative Commons (CC) license, (b) for higher education (HO) and Kennisnet by using the SURF-Edurep service and (c) for harvesting by using the Open Archives OAI-PMH protocol. What is more, possible 'loose' coupling of developed courses and games will occur with the institution-specific Electronic Learning and Work Environment (ELW). The results from the studies (especially the raw data) will remain available via DANS-Easy, and the (scientific) publications will become widely available via Open Access Journals and the PURE repository. To this end, descriptions follow on how each stakeholder target group can make use of the Gamebrics project outputs.

### Teachers

A core beneficiary of the Gamebrics project outputs are the teachers. Firstly, by using the Gamebrics outputs it is expected that the supervision burden for teachers will decrease. Secondly, teachers will get access to a user-friendly and validated input tool that provides virtual guidance with automated (synchronous) formative assessment of analytical thinking skills. Thirdly, 'emergency remote teaching' (e.g., due to COVID) is expected to become less demotivating. Fourthly, teachers will acquire valuable experience from the involvement in the procedure of designing serious games. Fifthly, they will involve in the consultation regarding the usability, ease of use, and efficiency of the formative assessment method, and further optimizations on the Gamebrics tooling. Sixthly, they will get access to a manual on the use and possible adaptation of the Gamebrics tools in different contexts. Seventhly, teachers will acquire insights on the perceived gains in educational effectiveness ease of use, and usefulness through conducting semi-structured interviews. Eighthly, they will be acquainted with the elaboration and practical application of Gamebrics as well as with the findings from the pilot studies. Finally, teachers will be acquainted with the elaboration and practical application of Gamebrics as well as with findings from relevant pilot studies.

### Researchers

Researchers will be involved and informed frequently and in many different ways, so that the results of the Gamebrics project are widely usable, accepted and known. Most notably, they will get access to results from the Gamebrics studies (especially the raw data) which will remain available via DANS-Easy, while also to the (scientific) publications that will become widely available via Open Access Journals and the PURE repository.

## Education Coordinators

Educational coordinators will acquire experience from their involvement in the procedure of designing serious games (Management & Organisatie en het Onderzoekspracticum). In addition, they will be acquainted with the elaboration and practical application of Gamebrics outputs as well as with the findings from relevant pilot studies. Furthermore, they will be Involved and informed frequently in different ways, so that the results of the Gamebrics project are widely usable, accepted and known.

## Serious Game Developers

Serious game developers will get access to a user-friendly and validated input tool that provides virtual guidance with automated (synchronous) formative assessment of analytical thinking skills. Additionally, they will be acquainted with the elaboration and practical application of Gamebrics as well as with the findings from relevant pilot studies.

## ICT specialists

ICT specialists can benefit from Gamebrics project outputs by (a) implementing the serious games using the Gamebrics tooling in their own organization, (b) re-using (part of) the source code from the Gamebrics tooling, and (c) get knowledge of the Gamebrics tooling architecture.

## OU colleagues

The mission of the OU is to offer personalized and activating online education at a distance, and the Gamebrics project fit in perfectly with that. The main reason is that Gamebrics outputs have the potential to allow for the training of complex skills (e.g., analytical thinking) via online education (i.e., serious games). Several ongoing projects of OU colleagues will benefit from the use of the Gamebrics outputs such as EMERGO (SURF), Viewbrics (NRO), and Pe(e)rfect Skilled (SURF) project (on presentation skills) whom never before had access to e-rubrics integrated into the gameplay. In specific, the Viewbrics experience and tooling of Pe(e)rfect Skill will be used in the further development and integration of the rubric within EMERGO, in particular for the display of the 'skill wheel' with levels of and feedback on sub-skills. What is more, the faculties of Management Sciences and Psychology at OU will get access to a domain-independent and analytical rubric for analytical skills in two existing serious games used in their educational practice. Nonetheless, the proposed approach is educationally scalable and can be used in both distance learning and more 'blended' or 'hybrid' practice-oriented skills education. The project has the potential to further improve not only skills education within the OU, but for the entire higher education sector 'across' institutions.

## General Public

By using the Gamebrics project outputs, the general public can become aware of the existence of serious games that provide in-depth deployment of analytical thinking skills and their consequent assessment by using rubrics and learning analytics. In addition, they can become aware of the general developments on the field of serious game tooling that is based on principled assessment and feedback methodologies by getting access to all the emerging Gamebrics publications and scientific research.





### Section 3: Potential Future Stakeholders

Gamebrics dissemination activities have already resulted in yielding interest from potential future stakeholders, including interested people from academia as well as institutes. Most notably, interest was raised for the potential future use of the Gamebrics outputs during the CSEDU23 conference in Prague and accordingly a follow-up meeting was arranged with academics from the University of Applied Sciences Berlin in Germany and the Masaryk University in Czech Republic. What is more, potential future stakeholders have been proposed by the SG (steering group) members. As such, Avans, Curio, BUAS, Tilburg University, Vrije Universiteit (VU), and Hogeschool Utrecht (HU) have been proposed as possible institution candidates. Individual persons have also been suggested to act as ambassadors such as Wilfred Rubens, Judith van Hooijdonk and Barend Last due to their social media reach.

### References

Hugo Huurdeman, Hans Hummel, Rob Nadolski, Giel van Lankveld, Konstantinos Georgiadis, Johan van den Boomen, Hub Kurvers, Petra Neessen, Ron Pat-El, Aad Sloomaker (2023). Gamebrics: Integrating Analytical Rubrics into Serious Games to Teach Analytical Skills. In: Jelena Jovanovic, Irene-Angelica Chounta, James Uhomobhi, Bruce M. McLaren: *Proceedings of the 15th International Conference on Computer Supported Education, CSEDU 2023, Volume 2*, pp. 403-409. Prague, Czech Republic, April 21-23, 2023. SCITEPRESS 2023, ISBN 978-989-758-64