

**IDEAL-GAME**

*Improving didactics, education and learning
in HE with the Online Serious Game Creator*

**Layman`s Report / IDEAL GAME IO5 \_ A2**

**Produced by UPIT**

**Project Title:** Improving didactics, education and learning in HE with the Online Serious Game Creator

**Acronym:** IDEAL-GAME

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**Project partners:** P1 Universität Paderborn (UPB), Germany (DE)
 P2 Ingenious Knowledge GmbH (IK), Germany (DE)
 P3 Universitatea din Pitesti (UPIT), Romania (RO)
 P4 Wyzsza Szkola Ekonomii i Innowacji w Lublinie (WSEI), Poland (PL)
 P5 University of Dundee (UoD), United Kingdom (UK)
 P6 Universidad a Distancia de Madrid SA (UDIMA), Spain (ES)

1. **STATEMENT OF THE PROBLEM**

With more than 32.800.000 entries on Google™ until December 2020, the megatrend of digitisation, caused by global change, illustrates the importance of digitisation in every organisational context, especially since the Covid-19 pandemic crisis brought this issue to the forefront. In the field of education, the importance and relevance of digital change are increasing, providing challenges in all walks of life, including the Higher Education` sector. Consequently, **it is necessary to support the education system with innovative knowledge and motivating ways of learning and teaching to meet the challenges of digitisation**. An effective didactic method is to incorporate in the learning and teaching practice a motivational game-based learning approach combined with a Flipped-Classroom concept.

This Layman`s Report summarizes the latest situation in the use of Serious Games in Higher Education (HE) from the perspective of their educational and pedagogical significance, as well as how to implement them as good learning and teaching practices for lecturers and students. The present study finds that, although Serious Games are a widespread type of educational resource, they are not being used to their full potential in European HE.

1. **OVERVIEW OF THE IDEAL GAME PROJECT**
	1. **Introduction to IDEAL GAME project**

In order to improve this deficient situation, the ambitious project named ***“Improving didactics, education and learning in Higher Education with Online Serious Game Creator”*** [acronym **IDEAL GAME**] was carried out by a consortium of six partner-organisations from five European countries. The project was financed by the Erasmus+ Programme of the European Union – a Strategic Partnership for HE and has the reference number 2020-1-DE01-KA203-005682. The project duration was 28 months from 01.09.2020 to 31.12.2022. More information is available on the project official website <https://ideal-game.eduproject.eu> .

The project consortium is composed of four public universities, one non-public university and one IT company providing educational resources, as follows:

* Universität Paderborn (UPB) – DE (<https://www.uni-paderborn.de/en/university>)
* Ingenious Knowledge (IK) – DE (<https://www.ingeniousknowledge.com/?id=1>)
* Universitatea din Pitești (UPIT) – RO ([www.upit.ro](http://www.upit.ro))
* Wyzsza Szkola Ekonomii i Innowacji w Lublinie (WSEI) – PL (<https://rekrutacja.wsei.lublin.pl/en/>)
* University of Dundee (UoD) - UK (<https://www.dundee.ac.uk/>)
* Universidad a Distancia de Madrid SA (UDIMA) – ES (<https://www.udima.es/es/la-udima.html>)
	1. **Objectives and expected results of the IDEAL GAME project**

**The main objective of the IDEAL GAME project** is to support the process of learning and teaching in Higher Education Institutions (HEIs) in a modern and innovative manner which is underpinned by the use of serious, intelligent and fascinating games. For this purpose, the project consortium designed an advanced **Online Serious Game Creator** **provided as Open Educational Resource (OER)**, which can create, test and evaluate Mini-Serious Games within learning scenarios. This flexible digital tool was designed in a way that the Serious Games can be equipped by the users with different content, so they can be easily integrated into modules and lectures and individually adapted to different scientific disciplines and fields of activity.

**The innovative idea of the IDEAL GAME project** is to combine Serious Games with the Flipped-Classroom concept in order to motivate and support the students in their learning activities in a modern and attractive way. This fits to the needs of both **target groups of the IDEAL GAME project**:

* teachers in HE, who can use the online IDEAL GAME Serious Game Creator Tool to create their own Serious Games fitting to their lecturers and study programmes
* students, who are looking for more reflection on subjects studied in their designated courses and are used to new information technology in their daily lives.

**The expected results of the IDEAL GAME project** are the following:

1. online IDEAL GAME Serious Game Creator Tool
2. 50 Mini-Serious Games created with the IDEAL GAME Creator Tool and provided as OER on the online platform of the project website along with their corresponding learning scenarios
3. Flipped-Classroom concept for the integration of the Serious Games in HE modules and courses
4. Collection of best practice teaching resources provided as OER
5. Research report on the use of Serious Games in HE
6. Learning materials regarding the use of the IDEAL GAME Serious Game Creator Tool: Video Presentation of the Tool, Didactical Handbook for Lecturers, Tool Handbook for Lecturers and Tool Handbook for Students
7. IDEAL GAME Policy Paper with recommendations to academics and policy makers in HE
8. IDEAL GAME Layman`s Report with basic information from the whole project expressed in plain language easy to understand by the general public
9. IDEAL GAME website with information on the project and links to the Creator Tool, the designed Serious Games and their corresponding learning scenarios
10. IDEAL GAME dissemination materials: social media, newsletter, poster, leaflet, flyer, marketing material, etc.

As a challenging project, **IDEAL-GAME develops and delivers a set of five comprehensive results**, consisting of the following **Intellectual Outcomes (IOs)**:

* IO1: State-of-the art Research on learning with Serious Games in HE
* IO2: Development of an Online Creator Tool for Serious Games in HE
* IO3: Development of Serious Games and learning materials and their implementation as OER
* IO4: Creation of the Handbooks for didactical background and for the use of the Creator Tool
* IO5: Writing of the Policy Paper and Layman`s Report

A relevant Usability Survey on IO2 and IO3 was carried out in every partner HEIs and the very positive results and excellent feedback obtained demonstrated the successful usability of the IDEAL GAME Online Creator Tool and OER Platform in the learning and teaching design in HE.

1. **FLIPPED-CLASSROOM APPROACH**
	1. **Flipped-Classroom concept**

**Flipped-Classroom** or **Flipped-Learning** is one of the new teaching methodologies that have emerged as a result of the constant updating of the educational field. It is understood as a teaching method of hybrid character, where the attendance performance is merged with the pre-lecture directed study one. This method mixes direct instruction, developed in a traditional way through the expository method, with constructivist actions, which provokes a change in the roles of those involved in the teaching and learning process.

Also, this advanced instructional strategy moves activities traditionally been considered homework into the classroom. Such transformations can be achieved combining classic lectures with dedicated pedagogical instruments, like Web-Based Learning (WBL) and Massive Open Online Courses (MOOC), delivered outside the classroom as OER and accessed with appropriate means of communication like PC, tablet, smart-phone, etc. In a Flipped-Classroom approach, students watch online lectures, collaborate in online discussions, or carry out research within an ICT - assisted learning process, while engaging in concepts in the classroom with the guidance of a mentor.

* 1. **Common European approach on Flipped-Classroom designs in HE**

One of the essential keys of the **European Higher Education Area (EHEA)** (<https://education.ec.europa.eu/>) was the establishment of the **European Credit Transfer System (ECTS)** (<https://education.ec.europa.eu/education-levels/higher-education/inclusive-and-connected-higher-education/european-credit-transfer-and-accumulation-system>) as a common measurement unit to complete the information and facilitate mobility and employment prospects of EU citizens. ECTS credits are allocated to all educational components of a HE study programme (including modules, courses, dissertation, research or practical work, different forms of testing, work placements, etc.) and reflect the quantity of notional effort required by each individual component in order to achieve specific objectives or learning outcomes relative to the total quantity of work necessary to successfully complete a full year of study.

The European Credit Transfer System (ECTS) states that the accounting for the time spent in learning has two essential parts: classroom teaching (work with the professor) and distance learning (work without the professor, whether in an individual or collective way). Due to the COVID-19 crises, the importance of distance learning was brought to the fore, so **the Flipped-Classroom designs in HE currently represents the predominant didactic strategies, including on the acceptance of modules from other European universities**. In this way, the teaching and learning processes are carried out with aids that the professor prepares, so that the student works independently before the classes, thus being able to dedicate more effectively the classroom teaching time to a more complex learning.

1. **INNOVATIVE FORMS OF LEARNING AND TEACHING IN HE**
	1. **Change of policy approach on learning and teaching practices in HE**

Nowadays E-learning and digitization in HE become more and more important. Additionally, there is a high interest in the development of new and innovative teaching and learning environments for HE all over the world. In particular, gamification has an increasing role in the didactic considerations of the best practices in learning and teaching in all scientific fields of HE. In this regard, **the use of the Serious Games in modern HE is very suitable, because this way teachers and students can combine the latest ICT technologies with the requirements of best practices in learning and teaching**. Therefore, a change of policy approach in learning and teaching practices in HE regarding the use of Serious Games is absolutely necessary in the sense of incorporating a motivational game-based learning approach as an integral part of Flipped-Classroom concept.

**Integrating Serious Games in modules and lectures in HE determines visible positive effects on students** through the stimulation of their thinking in connection to authentic situations in real life and also strengthens their self-confidence in adequate management of the topics addressed. Achieving these beneficial effects on students is also significantly determined by the specific advantages of using Serious Games in the learning process: immediate feedback, strong interactivity and the chance to enhance collaborative learning. Thus, the use of Serious Games in HE stimulates cognitive processes of the students and contributes to increasing their scientific training.

* 1. **IDEAL GAME approach to implementing Serious Games in HE**

**The main** **innovative idea of the project is to engage the students in in a Flipped-Classroom approach with the use of Serious Games**, which can be integrated in modules and lectures and also provided as OER. By using this innovative didactical method, students are engaged in the online phases of their learning process, where the learners prepare lessons and learn new aspects, concepts and theories in self-directed online learning. Then, they come back to the classroom lesson to reflect and discuss on the learned topics and use the face-to-face learning time to deepen knowledge and compare understanding and positions under the guidance of their lecturer.

By ​​combining the Flipped-Classroom approach with Mini-Serious Games, IDEAL GAME project implements an effective method to motivate the students in their academic activities, to support their learning and to introduce them to a new modern and attractive way of learning that increase their level of knowledge. In this way the IDEAL GAME project is embedded in the improvement of the quality of study programmes in HE in order to enhance didactics and education, as well as learning and teaching practices in HEIs.

1. **INSIGHTS FROM THE OUTCOMES OF THE IDEAL GAME PROJECT**

The main results of the IDEAL-GAME project consist of five intellectual outcomes (IOs), as follows:

**IO1: State-of-the art research on learning with Serious Games in HE**

The research was conducted in two ways: on the one hand, desk-based research was undertaken through literature review; on the other hand, field-based data was acquired through an online survey questionnaire answered by at least 100 participants in each partner country. **Based on the findings from desk- and field-based research, a comprehensive Research Report was elaborated** and it is accessible on project platform at <https://ideal-game.eduproject.eu/?page_id=16> . The report was the basis for the IDEAL GAME Creator design and for the selection of the necessary Mini-Serious Games, including additional OER worksheets and topics, as well as ensuring the fit to the target groups.

**IO2: Development of the Creator Tool**

The Online Serious Game Creator is an important outcome of the project. It is designed as a flexible and easy to handle digital tool that give teachers in HE the opportunity to create tailor-made Serious Games for their courses and seminars, effectively adapted to be used in various study programmes and study modules in many scientific fields. Therefore, the lecturers can use this digital tool to create different types of new Mini-Serious Games, which can be properly integrated in their HE modules and lectures, such as the following:

* serious games for learning professional and subject related vocabulary
* serious games for assignment of corresponding facts and terms
* serious games which focus on process flows
* competitive serious games to enhance learning
* puzzle games to get in contact with models and theories etc.

After the design and the development of the tool, a Usability Survey with at least 70 users (lecturers and students in HE) per partner country was implemented in order to improve the IDEAL GAME Creator Tool. The testing results were very positive and the feedback was excellent: both the lecturers and the students could easily handle the tool and effectively implement it in their learning and teaching processes. The successful implementation of the Mini-Serious Games Creator Tool in partner HEIs strengthened the idea to offer it on a broader basis. Therefore, at the moment, **the IDEAL GAME Creator is developed as a browser tool** and its improved final version is made available for free in all project languages at <https://ideal-game.eduproject.eu/?page_id=16> .

**IO3: Development of the Serious Games and learning materials and their implementation as OER**

Using the IDEAL GAME Tool, the partners created more than **50 different Mini-Serious Games** for their modules and lectures. Moreover, they developed **corresponding learning scenarios in which the games are embedded**. The innovative element of the project was to combine Serious Games with learning materials to provide a Flipped-Classroom approach. Serious Games developed by IDEAL GAME project are digital tools especially designed to improve the processes of thorough understanding, easy memorising and in-depth learning and also to reduce stress during these intellectual activities. The lecturers can implement new Serious Games in HE courses using the IDEAL GAME Creator Tool in order to promote student’s digital learning, improve their intellectual activity and also incorporate a motivational game-based learning approach combined with a Flipped-Classroom concept and other best practices in learning and teaching~~.~~

All the designed Serious Games and learning materials are available in all project languages on the **IDEAL GAME OER Platform** at <https://ideal-game.eduproject.eu/?page_id=16> There, the users can find and play a variety of games, such as*: (a) Raining Words, (b) Collecting Words, (c) Memory, (d) Build a Bridge, (e) Crane, (f) Quiz Game, (g) Conversation Game* and *(h) Explore Campus*. All these various types of Mini-Serious Games are useful to lecturers not only as they enable various approaches with the students on the same subject, but also as they offer a mix of Serious Games within a course to ensure additional engagement and motivation.

**IO4: Creation of the Handbooks**

To make sure that the use of the IDEAL GAME Creator Tool is easy to understand and also that the didactical concepts are made available and usable by the designated users (assistants, lectures, professors and students), three different handbooks were developed:

**Didactical handbook for lecturers**: provides lecturers in HE with the knowledge to create the curriculum behind the Serious Games Creator Tool and how the tool can be integrated into the planning of learning scenarios and lesson plans. It offers didactical materials and resources, overviews and examples of teaching scenarios, along with learning outcomes matrices. In addition to these, curriculum and learning outcomes matrix-templates are provided, which lecturers only need to complete.

**Handbook for lecturers**: offers lecturers in HE a guide on how to use the Serious Games Creator Tool to create contents for Serious Games suitable for their courses and students' level of understanding. It enables the lecturers to choose from the different Serious Game formats the most appropriate one for a specific subject addressed in a certain course, so that their new created Serious Game can integrate seamlessly into the didactical setting of a Flipped-Classroom approach.

**Handbook for students**: offers students an explicit guide on how to use the Serious Games and their different formats provided with the IDEAL GAME Creator Tool, as well as the learning scenarios.

These handbooks are provided as OER at <https://ideal-game.eduproject.eu/?page_id=16> and represent useful guides for the project users to enhance the quality of learning and teaching in HE.

**IO5: Writing of the Policy Paper and Layman`s Report**

Policy Paper and Layman’s Report are documents elaborated by the project consortium towards the end of the project lifetime. Both documents are available on project website at <https://ideal-game.eduproject.eu/?page_id=16> .

**Policy Paper**: presents recommendations for HE providers and European policy makers on the use of the IDEAL GAME Tool and the Serious Games, as well as Flipped-Classroom approach. Thus, it considers why a change of policy approach might be relevant as well as emphasizes on the policy options available and the pros and cons of each option. It recommends a course of action based on the experiences and lessons learned in the course of the IDEAL GAME project.

**Layman’s Report**: presents all the basic information from the whole project, including its outstanding achievements, rendered in plain language easily to understand by the general public.

1. **TESTIMONIALS FROM BENEFICIARIES**

The beneficiaries of the IDEAL GAME project expressed their interest and satisfaction with the notions taught during the Usability Survey of the OER IDEAL GAME Platform, which they considered a useful training experience in their future activity in HE. Next are testimonials from some of them from each partner country in the project:

**Testimonials from Germany**

**R.R. – University Lecturer:** “I have tested four games and have included them into my lectures. They are easy to create and it is also easy to use them in the lecture. They are fun and very interesting for my students in the field of teacher education and teacher studies. The raining words game is easy to adapt to all sorts of lectures and so is the bridge building game. After some problems in the beginning, it now works really well. I also use the helpful quiz game and the adaption of the collecting words game. They are easy to follow, too. The IDEAL Game tool is great and I will use it in future lectures.”

**N.C.G. – University Staff Member:** “At our chair we integrated the IDEAL GAME mini serious games into different lectures. The result was amazing. The students were interested in solving the challenges of the games and had several questions concerning the content after playing and learning with the games. So, an additional activity could be introduced and the feedback was excellent. So, learners at some difficulties at the beginning but this was addressed and solved easily.”

**Stephan – Academic Teacher:** “A game-based way of learning and repeating knowledge is always a good idea. The IDEAL-GAME Creator specialises in designing mini serious games that bring short-term effects. Certainly, the limitation of mini serious games is a question of cost, but in the medium to long term, serious games in the category of business games, stock market games, role-playing games are more profitable. I think the project has produced a great result that can be used individually in lectures. However, this would require a restructuring of university didactics in such a way that constructivist learning theories would have to be followed much more.”

**H.L. – Creator of Game Adoptions:** “The mini serious games offer the chance to get in contact with the students in a different and innovative way. I had to learn how to adjust speed and action in the games in a way that it was fitting to the needs of the learners and that the elements were not coming to slowly or quickly, especially in the raining words game. When I found the most fitting settings everything became very easy. The creating is done in a quick process and not time-consuming. I would always recommend the IDEAL GAME mini serious games.”

**P.G. – Teacher Student:** “We used the mini serious games in our module and it was fun. The good thing is that it combines an interesting task with a learning activating. In our group of learners, we all felt motivated by the games. I like the variety of games. Sometimes the results of the games could be more discussed in the course. But they are definitely helpful for my learning processes and the preparation for the exam at the end of the module.”

**Julius – University Student:** “I think it's great to have the opportunity to play a game in a lecture or seminar. This is super innovative and I have never experienced this in any other lecture before. The IDEAL-GAME Creator gives me a new approach to the lecture and seminar content. However, I don't think I will use the IDEAL-GAME Creator at home, but I find it very exciting for a change in the lecture.”

**Testimonials from Romania**

**C. – Mathematician & Computer Science Specialist, Assistant Professor:** “The topics addressed in the IDEAL GAME Mini-Serious Games were relevant for me in the national and European context. I think they were interesting for all participants, both among those who had a professional training in designing Serious Games or related fields, like I do, and among those who did not have professional or personal experience on this matter. Therefore, I am willing to participate in future actions and projects that will promote the use of the Serious Games in the University of Pitesti and I consider that a very effective procedure to achieve this goal would be exchanging experience with teachers from other universities, both in Romania and in foreign countries.”

**D. – Physicist, University Lecturer:** “I had the opportunity to test the OER IDEAL GAME Platform and I learnt useful information about using Serious Games in HE that can help me in my personal and professional training. I tested all the prototype Serious Games already developed on the platform and I found them intuitive and easy to use. Also, I look at some of the learning scenarios produced by the IDEAL GAME team and I found them to be helpful, too. This way, I gained more knowledge about the importance of using Serious Games in HE and I think that all these various types of Mini-Serious Games are useful to students not only to have various approaches on the same subject, but to offer additional motivation to learn and to integrate different perspectives on the subjects studied. So now I realize how these Serious Games can be created and adapted to the contents of my lecturers and some of the modules taught in my department. As a result, I intend to use the OER IDEAL GAME Platform to create my own.”

**M. – PhD Student in ICT:** “Discovering the IDEAL GAME Mini-Serious Games was a very pleasant activity for me. On the OER Platform of the project I found a variety of games interesting and easy to play, which worked very well for me. A personal benefit of my participation in the Usability Survey of the IDEAL GAME OER Platform was that what I learnt can be a help in fulfilling my desired job, as a game designer. In this regard, not only that I tried all types of Mini-Serious Games developed on the platform, but I also created two short games related to one of my classroom projects and my teacher really appreciated my effort. So, I am very enthusiastic about IDEAL GAME project and I intend to use its OER Platform in the near future to develop my own skills in designing Serious Games.”

**Testimonials from Poland**

**Jan – English Teacher:** “I am positive about the idea of a fully free serious game creator. However, after testing the tool, I have some suggestions for improvements that would help them exploit the full potential of the Ideal Game creator. The most important one concerns the feedback that the users of the game get. Currently there is almost no such feedback. E.g. in quiz games there is only information on whether the answer was right or wrong. If you give a wrong answer, there should be immediate information about which answer was right. In other games, apart from the quiz, there is no information at all on whether a given answer was right or wrong. In addition, at the end of the game, there should be a summary of the participant's answers, indicating which were right and wrong and what the correct answer should be. Without this kind of improvement, the use of the wizard is not valid. Keep on your ambitious work. There are still some improvements to make but you will get there.”

**Joanna – Academic Teacher:** “I am a huge fan of a flipped classroom approach. Therefore, when I heard about the Ideal Game project and its aims, I was more than positive. This idea definitely should be promoted! When it comes to the creator itself, though, I must point out that the available game types are fairly standard compared to available market solutions. Ideal Game creator offers a much smaller selection of games than other creators e.g. wordwall.net, even in its free version. The offering in this area should therefore be expanded. Moreover, when creating games for new users, it was quite confusing for me to select from a drop-down list. It does not allow you to get an idea of what a particular game is about. It would have been better to see images symbolizing the games in question, along with a brief description of them. Even selecting a specific game from the drop-down menu does not necessarily bring users closer to the idea of the game. There is a lack of short descriptions of the rules, and there are not pictures for all types of games. It is something you must work on, but I am sure your effort will pay off.”

**Karolina – Educational Manager:** “Flipped classroom approach, serious games and blended learning are the future of education. It is surely worthwhile to “infect” teachers with more engaging teaching methods. For this reason, I am really happy that I took part in testing Ideal Game Creator. For the tool to have the potential to develop, improvements are needed to enable its use in the long term. For example, the possibility of searching for games by typing in the topic of interest into a special search engine. It would then be possible to use a game that has been created by another user of the wizard. In addition, the ability to organize games into folders is essential for long-term use. I will watch the development of this tool with interest.”

**Testimonials from UK**

**Q.K. – University Lecturer:** “I have tried three games and found them very interesting. I have developed my own game as well. It is entitled as "Fundamentals of Curriculum". I tried 'raining words game' on statistics. However, I could not really follow that. I clicked the words and tried to drag them to the relevant categories but that did not work. The other games which I tried were 'collect words' and 'quiz'. They were very straightforward and easy to follow. Thank you very much for inviting me to participate in the study. I find this game tool very interesting and would like to use it as means for formative assessments during the lessons.”

**N.A. – University Lecturer:** “I strongly believe in the flipped classroom approach so was keen to try out the IDEAL Game creator tool. I found it intuitive and easy to use. The prototype games that already existed as part of the website were really helpful in understanding how to create games but also in reflecting on the purpose of creating games for my own classroom. I had the opportunity to look at some of the learning scenarios produced by the IDEAL Game team and found them to be helpful too. I feel that I now understand better how these games can be created and become an integral part of my lessons plans.”

**A.D. – International PhD Student in the UK and University Lecturer in his home country:** “As a teacher, I accept as true that the successful educational process is a participatory one. Students tend to be more active, keen to learn and confident when different activities beside the one-way teaching is implemented within the classroom. I believe using different activities can recapture student’s attention and recharge their energy for learning. For me, one of the methods I have used is games within the classroom. Having games going on within the classroom takes out the seriousness from the teaching process and teaches the students in a more effective way sometimes because it captures their attention toward the concept that we are trying to explain in a better way. I have used quick quiz games, questions racing and other simple games while teaching and it showed me how important it is to use games while teaching. I even sometimes had to use quick non-educational games for few minutes to regain my students focus which shows me how important it is to implement serious games within the class. It simply supports and makes teachers more effective. I have used the IDEAL games such as the words collection game. I believe this game could be effective for my third- and fourth-year students since the courses at that stage, start to be aimed toward the critical thinking and discussion. Using this game could improve and help students in discussing and expressing the difficult concepts and perhaps using the words they collected to explain the concept to them could help them better understand it. Also, it could enrich their language skills since my students are Arabic-native students who study in English. Additionally, I think the IDEAL Games design will capture student attention which will recapture their focus and attention toward the teacher.”

**Testimonials from Spain**

**Pedro – Academic Teacher:** “As a teacher of online teaching, I try to be informed about these kinds of solutions and activities, which can make learning more enjoyable and thus increase students' interest in the subject. After using the IDEAL GAME Serious Game Creator, I find that it can be a bit confusing to create certain games, for example, where words fall and you have to adjust the speed at which they fall. Once you put some time into it, I was able to adjust it well and the games are fine. Perhaps the platform is missing some small improvements to make it attractive for regular use. I greatly appreciate this kind of initiatives, and I think they are very enriching for the educational community.”

**Marta – Academic Teacher:** “I have used the IDEAL GAME Tool to evaluate its incorporation into my subject, with a view to carrying out review activities or opening up the topics. It is a tool that can still be improved in certain aspects, but it works well. I find this kind of educational projects very interesting and I will follow the progress of IDEAL GAME in order to test the final version of the creator.”

**Susana – University Student:** “I have played the game and I don't know if I could or even if my comment is out of place, but I think it would be interesting, some command to retry or play again, because at least I had to reload the page to play the "raining words" game. Apart from that, I found the games educational and entertaining. The platform is simple and has worked well for me.”

These testimonials from the beneficiaries entitle the project consortium to consider that **the IDEAL GAME project was a real success**!

1. **RECOMMENDATIONS AND CONCLUSIONS**
	1. **Recommendations from IDEAL GAME project**

Current best practices in learning and teaching in HE demonstrates there is a need for a strong emphasis on the development of topics and learning activities in the e-learning environment. Because of this, **the Flipped-Classroom concept, as well as the development of Serious Games in HE, offered by IDEAL GAME project, is welcome**.

According to the best practices in the design and production of Serious Games format teaching resources, the IDEAL GAME Mini-Serious Games are effectively implemented in HE courses and lecturers if they meet the following conditions:

* They are grounded in an understanding of the learning process.
* They are based on the needs of adult learners.
* They accommodate a range of learning styles.
* They are adaptable to a wide variety of scientific disciplines and field.
* They link theory and practice.
* They are easily accessible.
* They offer flexible delivery.
* They provide flexible assessment.
* They are strongly interactive.
* They have an attractive graphic design.

Next, the consortium of the IDEAL GAME project recommends a basic framework for developing an effective e-learning environment in HE by using the IDEAL GAME OER Platform and Creator Tool, based on the experiences and lessons learned during the IDEAL GAME project:

* There is a need for an emphasis on the development of topics and learning activities in the e-learning settings in HE.
* There is also a need to combine Serious Game with some parts of the HE courses, because it is always helpful to rethink the content and to provide feedback to the learners, who are keen on receiving additional information from the lecturer.
* The content of the IDEAL GAME Flipped-Classroom concept and the IDEAL GAME Mini-Serious Games have to be specific to lecturers and learners with information and guidance on dealing with innovative learning resources in HE.
* The pedagogical and didactical elements within the additional IDEAL GAME learning materials (Power-Point-Presentations, Texts, Graphics and Audios) have to be designed according to the criteria: motivation and engagement of students, structure, clarity, different perspectives, reflection elements, feedback possibilities and assessment.
* The content of the IDEAL GAME OER Platform and the Online IDEAL GAME Serious Game Creator Tool have to meet with the European Standards for Open Education and Open Learning Resources (EU-StORe).
* The legislative framework concerning the European HE`s sector has to be absolutely considered in the IDEAL GAME concepts and outcomes.
* Concerning the creation of the Mini-Serious Games, interactive elements have to be integrated in order to create a broader perspective and to attract a larger audience.
* Concerning the Flipped-Classroom concept and the interactive tasks for the Online IDEAL GAME Serious Game Creator Tool, the collection of best practice of teaching resources should be addressed. Relevant examples are H5P (abbreviation for HTML5 Package) tasks, a free and open-source content collaboration framework based on JavaScript, especially designed to easily create, share and reuse interactive HTML5 content, such as interactive videos, interactive presentations, interactive timelines, quizzes, etc.
	1. **Conclusions resulting from the IDEAL GAME project**

**The IDEAL GAME project successfully provided a Creator Tool and an OER Platform** with the specific purpose to support lecturers in creating different types of Mini-Serious Games, which can be integrated in modules and lectures in HE. Following, this will support teachers with innovative learning resources as well as learners with modern ways to deal with topics and learning activities. **The results of the project also show that a suitable approach of Flipped-Classroom concept is mixing the traditional classroom activities with Mini-Serious Games**, which can be integrated in modules and lectures and also provided as OER by using the IDEAL GAME Creator Tool.

In the partner countries, both the lecturers and the students could easily handle the tool and effectively implement it in the teaching and learning processes by adapting various Mini-Serious Games to the different modules, courses and lectures. Moreover, the teachers in the partner HEIs were able to create additional lesson plans, as well as learning and teaching resources, using the project OER Platform.

A Usability Survey on the Creator Tool, the designed Mini-Serious Games and their corresponding learning materials was carried out and the testing results were very positive. The lecturers and students easily got accustomed to the designed Mini-Serious Games and could handle them perfectly. The excellent feedback strengthens the idea to offer IDEAL GAME on a broader basis. Although the lecturers stated that the use of the Creator Tool is easy, they made clear that it is necessary to test a little bit with the settings of several games. For example, the appropriate speed range for generation of terms and items on the screen and their display time in some games have to be adjusted to the specific needs and the lengths of the texts. Nevertheless, there is also the need to combine the Serious Games with other parts of the lectures, modules or courses, because it is always helpful to rethink the content and to provide feedback to the learners, who are keen on getting additional information by the lecturer.

In total, the IDEAL GAME project is successful and the usability of the Serious Game Creator Tool is really good, indicating that it is a trustworthy result of an in-depth research of best practices in the design of e-learning environments.

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