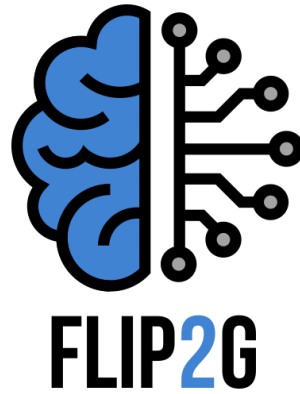




Deliverable 7.3

Final Quality Assurance Report

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Abstract:	The document reports all quality assurance mechanisms undertaken during the project, reporting of deliverables' reviews, monitoring of risks and documentation of all factors that were taken into consideration for the successful delivery of the project.
Keyword List:	Risk, quality, plan, monitoring

Consortium

	<i>Role</i>	<i>Name</i>	<i>Short Name</i>	<i>Country</i>
1.	Coordinator, PBL	Aalborg University	AAU	Denmark
2.	Games developer	Nurogames GmbH	Nurogames	Germany
3.	PBL, academic partner	University of Macedonia	UOM	Greece
4.	Data analytics	ARTIFICIAL INTELLIGENCE TECHNIQUES, SL	Artelnics	Spain
5.	Academic partner	Northumbria University	Northumbria	UK
6.	Flipped classrooms	EKPAIDEFTIRIA E. MANTOULIDI S.A.	Mantoulides	Greece
7.	Secondary education	Revheim skole, Stavanger Kommune	Revheim	Norway

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List of Abbreviations

The following table presents the acronyms used in the deliverable in alphabetical order.

<i>Abbreviation</i>	<i>Description</i>
CA	Consortium Agreement
EACEA	Education, Audiovisual and Culture Executive Agency
WP	Work Package

Executive Summary

The Flip2G project aims to establish a Knowledge Alliance between higher education institutions, schools and private companies that will boost skills development and introduce novel, data-driven approaches to education and training.

WP7 is the Quality Assurance work package for FLIP2G. Its main aim is to provide quality monitoring mechanisms that will guarantee the results' superiority as well as the timely progress of the project. A quality assurance strategy and a corresponding plan will specify the procedures and criteria for the overall quality assurance of the project results and will provide co-ordination of the testing and quality checks that will be undertaken in the course of the work of the other WPs.

The present deliverable is the final deliverable of WP7, D7.3– Final Quality Assurance Report. Its purpose is to provide feedback on all mechanisms carried out during the second half of project's lifetime for the quality assurance of its outcomes.

More specifically, this deliverable focuses on the following aspects and analyses:

- Update of the e-quality framework's concepts with FLIP2G related factors that were taken into consideration regarding quality assurance.
- Information on the peer review process for the upcoming deliverables of the project.

1 Introduction

1.1 Scope

This deliverable presents the procedures to be followed by the FLIP2G consortium in order to assure high quality of results and effective risk monitoring and mitigation.

1.2 Audience

The intended audience for this document is the FLIP2G consortium and the European Commission.

1.3 Structure

The structure of the document is as follows:

- Section 2 presents the e-learning quality assurance framework and the quality assurance factors as identified by each partner.
- Section 3 presents the main points of the final SWOT analysis.
- Section 4 presents the main points of the final risk analysis.
- Section 5 presents the peer review of the FLIP2G deliverables.

2 Quality assurance: e-quality framework for FLIP2G

This section aims to provide a brief overview of the e-quality framework which is analyzed in D7.2, and document the factors that all partners filled out regarding each concept of the framework. Figure 1 shows the seven categories of the framework that should be taken into consideration while ensuring high quality in e-learning.

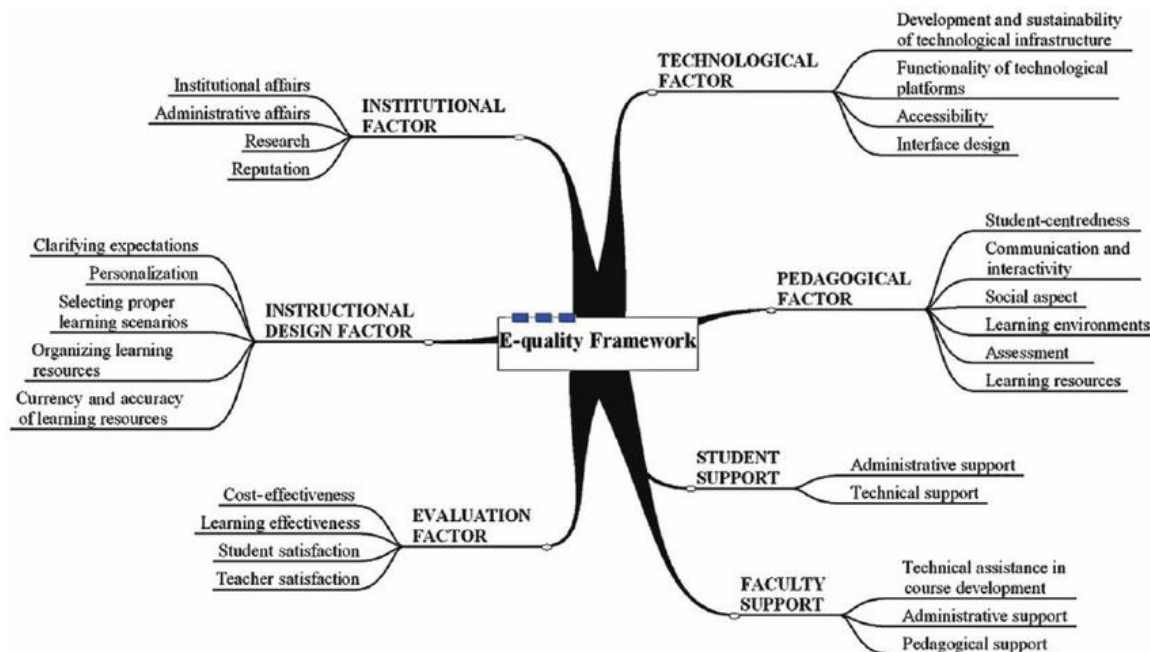


Figure 1 e-quality framework

The following tables provide feedback from all partners on their views for each factor of the framework and how it applies to the FLIP2G project and their perspective.

Table 1 Quality Assurance FLIP2G factors: Northumbria

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLIP2G objectives	
	Administrative affairs	Administrative processes run smoothly across the consortium	Using Google Drive/ email list /having regular TELCOs over Skype/
	Research	FLIP2G organizations' research teams are involved in PBL, flipped classrooms, LA, gaming	

		environments	
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	
Technological	Development and sustainability of technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	
	Accessibility	All members of the consortium will provide any relevant information required to the stakeholders for the successful employment of the FLIP2G results	
	Interface design	The gaming environment and the LA dashboard's interface will be user friendly and simple in interacting with all features	
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	
	Social aspect	Students' active participation during classroom and within the game allow their socializing	
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	

	Assessment	Different quiz results and LA visualizations will be available for student assessment	
	Learning resources	Learning resources of various modes will be available in the FLIP2G game	
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	At Northumbria University, students can ask for support for admin matters via their Student Portal or by contacting directly the Ask4Help team.
	Technical support	Technical student support is provided by each FLIP2G educational institution	At Northumbria University, students can ask for technical support from the dedicated IT support team (via phone, email, chat)
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	At Northumbria University, the TEL team supports the instructors in using various teaching & learning tools in their modules.
	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	At Northumbria University, the Post Award Coordination team offers support when it

			comes to financial/internal procedures related to the project.
	Pedagogical support	Pedagogical support is provided by each FLIP2G educational institution	At Northumbria University, a peer observation system is in place that allows tutors to exchange good practices and support each other in pedagogical matters. A series of events/workshops ("Education Matters") is organised every year that allows tutors to discuss how teaching practice can be further improved.
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization after the project's end	
	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	Multiple pilots are currently scheduled and involve all the partners. The FLIP2G model/game is being tested in different educational settings, including

			block teaching and modules that run for the whole semester. The students cohorts in the trials include secondary education students, higher education students, and degree apprenticeship students.
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	In progress
	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	In progress
Instructional design factor	Clarifying expectation	The design of all FLIP2G results has followed clearly defined learning objectives	
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	The students at Northumbria University are able to download the lecture slides

			for the module from the FLIP2G game (end of each quiz).
	Currency and accuracy of learning resources	Each educational institution will make sure the learning resources used in the trials will be accurate and relevant to the course's topics	At Northumbria University, each module goes through the Quality Assurance process that includes getting feedback each year from all the relevant stakeholders (e.g. students, programme leaders, partner institutions, employers etc.). This ensures that the content/design of each module meets the required standards.

Table 2 Quality Assurance FLIP2G factors: Nurogames

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLIP2G objectives	Nurogames is gaining knowledge in the various technical areas related to flip2g as well as enhancing its existing technology and code base.
	Administrative affairs	Administrative processes run smoothly across the consortium	Administrative processes run smoothly, no issues have been noted. Established communication channels like drive, mail and the regular meetings work well, response towards

			Nurogames' requests happens quickly.
	Research	FLIP2G organizations' research teams are involved in PBL, flipped classrooms, LA, gaming environments	The focus of research of Nurogames lies in gaming environments, especially related to PBL and flipped classroom.
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	Flip2G was presented multiple times by Nurogames to the public and potential stakeholders, with good feedback.
Technological	Development and sustainability of technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	Specifications were initiated in the beginning of the project, all of which were reached. For the project, the technological infrastructure at Nurogames was used and enhanced, especially regarding privacy issues.
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	The gaming environment features two games which can dynamically be adapted by teachers. The teacher dashboard features the option to access and adapt many data points and customization options, to ensure a smooth transition of data to the analytics module. Adaptions in the gaming environment were made throughout the whole project.
	Accessibility	All members of the consortium will provide any relevant	Communication within the consortium works well and Nurogames can answer any requests quickly.

		information required to the stakeholders for the successful employment of the FLIP2G results	
	Interface design	The gaming environment and the LA dashboard's interface will be user friendly and simple in interacting with all features	The UI for both the game and the teacher tool was designed by experienced game artists, UI designers and webdesigners. The dashboard interface is dynamic and adapts automatically to any changes, and all links can be reached with a maximum of 3 clicks. The tags used at multiple stages throughout the dashboard ensure a smooth user experience with many customizable options for teachers. The interfaces within the game are all diegetic to raise the immersion of the players.
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	While designing the game, the students perspective was kept in mind, and throughout the design process, the pedagogical partners were integrated in any design decisions.
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	
	Social aspect	Students' active participation during classroom and within the game allow their	The game, especially the multiplayer, needs communication and interaction (Best in a classroom environment, but can also be played at home e.g. while on the phone together) for the

		socializing	students to succeed.
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	Learning resources can be uploaded by teachers and user within games or outside of games. Learning activities and Interactions refer to the main content of the games.
	Assessment	Different quiz results and LA visualizations will be available for student assessment	
	Learning resources	Learning resources of various modes will be available in the FLIP2G game	Learning materials can be any type of file which the student can open (e.g. .psd files can be uploaded, but only opened if the student has an installed copy of Photoshop on their hardware)
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	
	Technical support	Technical student support is provided by each FLIP2G educational institution	Technical support Is provided by Nurogames, within the pilot time, the files were updated 18 Times, often based on requests or notes by the educational partners.
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	

	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	
	Pedagogical support	Pedagogical support is provided by each FLIP2G educational institution	
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization after the project's end	Including any future adaptations and updates, Nurogames will stay within the budget and allocated resources and will finish its work on the project as planned.
	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	The gaming environment was adjusted several times and more (especially bigger, invasive) updates are planned for the time in between trials.
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	

	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	
Instructional design factor	Clarifying expectation	The design of all FLIP2G results has followed clearly defined learning objectives	Learning objectives were designed by the educational partners and deployed by Nurogames in an iterative process based on regular reviewing and feedback.
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	The target groups were reviewed before start of the development and integrated into the design of the game, to appeal to students of first education and secondary education.
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	See above, in heavy communication with educational partners this was ensured.
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	
	Currency and accuracy of learning	Each educational institution will make sure the	

	resources	learning resources used in the trials will be accurate and relevant to the course's topics	
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Table 3 Quality Assurance FLIP2G factors: UOM

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLIP2G objectives	
	Administrative affairs	Administrative processes run smoothly across the consortium	
	Research	FLIP2G organizations' research teams are involved in PBL, flipped classrooms, LA, gaming environments	
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	
Technological	Development and sustainability of technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	
	Accessibility	All members of the consortium will provide any relevant information required to the stakeholders for the successful employment of the FLIP2G results	
	Interface design	The gaming environment and the LA dashboard's interface will be	

		user friendly and simple in interacting with all features	
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	
	Social aspect	Students' active participation during classroom and within the game allow their socializing	
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	
	Assessment	Different quiz results and LA visualizations will be available for student assessment	
	Learning resources	Learning resources of various modes will be available in the FLIP2G game	
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	
	Technical support	Technical student support is provided by each FLIP2G educational institution	
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	
	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	
	Pedagogical support	Pedagogical support is provided by each FLIP2G educational	

		institution	
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization after the project's end	
	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	
	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	
Instructional design factor	Clarifying expectation	The design of all FLIP2G results has followed clearly defined learning objectives	
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	
	Currency and accuracy of learning resources	Each educational institution will make sure the learning resources used in the trials will be accurate and relevant to the course's topics	

Table 4 Quality Assurance FLIP2G factors: AAU

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLIP2G objectives	
	Administrative affairs	Administrative processes run smoothly across the consortium	At AAU, there is dedicated administrative personnel for the management and financial reporting of the project. This personnel are also responsible for receiving the financial reports of the partners, combining them and submitting the required documents to the EC. At consortium level, there have been established collaboration and communication environments (Google Drive, Skype, emailing list) and there have been set up regular meetings, and concrete reporting guidelines
	Research	FLIP2G organizations' research teams are involved in PBL, flipped	The AAU team has several

		classrooms, LA, gaming environments	research groups that conduct research in all these fields.
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	All partners have indicated how to exploit the project results already at the stage of the interim report. According to these plans, it is clear that the FLIP2G results will contribute to improved reputation for all partners. Moreover, the consortium has already produced a wide variety of scientific publications presenting the project results, which have contributed in increased outreach in the relevant research fields.
Technological	Development and of sustainability technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	At AAU, the gaming environment and LA dashboard is hosted on an AAU secure server, which can only be accessed

			by the IT dpt. and the members of the consortium. Data collected is only accessible to the members of the consortium and the server is accessible with 2-way authentication when accessed outside the AAU campus.
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	The gaming module includes functionalities for teachers to implement and customize their courses (importing learning resources, questions, setting up quizzes, sessions, etc.). Moreover, it provides functionalities to administrators for sign up students to the courses, and it allows students to add information on their profile. The LA dashboard provides functionalities to teachers in order to see data for a specific course, a

			specific session, and a specific student (either per course or per session). Moreover it provides functionalities to students to monitor their own progress.
	Accessibility	All members of the consortium will provide any relevant information required to the stakeholders for the successful employment of the FLIP2G results	
	Interface design	The gaming environment and the LA dashboard's interface will be user friendly and simple in interacting with all features	Both modules provide UIs. Moreover, the gaming environment supports reusability of learning resources, games, questions, quizzes, etc.) The LA algorithms can also be reused in other contexts.
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	The FLIP2G model, which incorporates PBL elements supports active learning, and student-centred processes, by making students responsible for their learning and

			giving them independence on what they have to learn in order to solve specific problems.
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	This is a central part of the PBL pedagogy, which underpins the FLIP2G model.
	Social aspect	Students' active participation during classroom and within the game allow their socializing	The gaming environment contains multiplayer games that require student communication and collaboration.
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	This is fulfilled, see the section on functionalities
	Assessment	Different quiz results and LA visualizations will be available for student assessment	This is fulfilled, see the section on functionalities
	Learning resources	Learning resources of various modes will be available in the FLIP2G game	The game allows for the upload of images, texts, links, and videos.
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	At AAU, there is an administrator responsible for subscribing students to different courses, providing credentials for

			access, and updating access details when needed.
	Technical support	Technical student support is provided by each FLIP2G educational institution	At AAU, the students can get help from the IT support dpt. during working hours on all working days.
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	At AAU, faculty can get help from the IT support dpt. during working hours on all working days.
	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	At AAU, there is an administrator responsible for supporting faculty on administrative issues.
	Pedagogical support	Pedagogical support is provided by each FLIP2G educational institution	At AAU, the FLIP2G research team is responsible for supporting all teachers who want to incorporate the FLIP2G pedagogical approach in their courses.
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization	At the interim report stage, the consortium had produced all the

		after the project's end	expected results within the approved budget. At this stage, all partners submitted also a sustainability plan that will be updated by the end of the project in order to make sure that project results are sustained after the project's end.
	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	Several trials in three different sectors (secondary education, higher education, training) are currently running. The gaming environment will be adjusted based on the trial results.
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	See above. Student satisfaction has not been evaluated yet, though.
	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	See above. Teacher satisfaction has not been evaluated yet, though.

Instructional design factor	Clarifying expectation	The design of all FLIP2G results has followed clearly defined learning objectives	All trials are based on learning designs, where the learning objectives of each FLIP2G phase have been clearly defined.
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	The graphics and the gaming environment have been adjusted to be compatible with secondary education students.
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	All trial partners have been using the gaming platform to upload learning resources and design learning activities.
	Currency and accuracy of learning resources	Each educational institution will make sure the learning resources used in the trials will be accurate and relevant to the course's topics	This is so far the case for all trials.

Table 5 Quality Assurance FLIP2G factors: Artelnic

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLIP2G objectives	With this project, Artelnic is gaining valuable

			knowledge about Learning Analytics and improving its technology.
	Administrative affairs	Administrative processes run smoothly across the consortium	The coordinator and all partners carry out the administrative tasks without any problem.
	Research	FLIP2G organizations' research teams are involved in PBL, flipped classrooms, LA, gaming environments	The Artelnic team has carried out research on the main applications of learning analytics (clustering, prediction ...) and has developed technology for solving them.
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	In customer presentations, the company mentions its involvement in the Flip2g project, which contributes to its good reputation. We have also written several scientific articles together with other members of the consortium. Finally, the technological developments

			carried out by the company in this project will also serve to increase our reputation.
Technological	Development and sustainability of technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	We are developing our own technological infrastructure in accordance to privacy policies and with a high degree of functionalities on Learning Analytics. .
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	The Learning Analytics dashboard provides functionalities to support the work of teachers and monitor the progress of students during the course.
	Accessibility	All members of the consortium will provide any relevant information required to the stakeholders for the successful employment of the FLIP2G results	The platform developers and the educational centers are in permanent contact to ensure the proper functioning of the trials.
	Interface design	The gaming environment and the LA dashboard's interface will be user friendly and simple in	The consortium has done numerous

		interacting with all features	iterations on the interface to ensure the best user experience..
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	All research and development during the project has focused on active student participation and improvement in their learning process.
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	Multi-user games have been implemented to allow interaction between students.
	Social aspect	Students' active participation during classroom and within the game allow their socializing	Multi-user games allow students to socialize..
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	The developed learning environment allows to include learning resources and contain many learning activities.
	Assessment	Different quiz results and LA visualizations will be available for student assessment	The developed platform assesses the students performance in a continuous manner.
	Learning resources	Learning resources of various modes will be available in the	The game allows for the upload of

		FLIP2G game	images, texts, links, and videos.
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	All educational organizations provide administrative support to students in the use of the learning environment.
	Technical support	Technical student support is provided by each FLIP2G educational institution	All educational organizations provide technical support to students in the use of the learning environment.
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	All educational organizations provide technical support to teachers in the use of the learning environment.
	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	All educational organizations provide administrative support to teachers in the use of the learning environment.
	Pedagogical support	Pedagogical support is provided by each FLIP2G educational institution	All educational organizations provide support to teachers in the

			application of the FLIP2G pedagogical model.
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization after the project's end	The consortium had produced all the expected results within the project budget.
	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	Trials are being carried out in primary, secondary and university education. These are continually being adapted to ensure the effectiveness of the learning process.
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	To date, the trials have not been concluded and student satisfaction has not yet been measured.
	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	To date, the trials have not been concluded and teacher satisfaction has not yet been measured.
Instructional design factor	Clarifying expectation	The design of all FLIP2G results has followed clearly defined learning objectives	All trials are based on learning designs, where the learning objectives of each

			FLIP2G phase have been clearly defined.
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	The graphics and the gaming environment have been adjusted to be compatible with secondary education students.
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	Each educational institution has designed their courses using GBL guidelines.
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	All trial partners have been using the gaming platform to upload learning resources and design learning activities.
	Currency and accuracy of learning resources	Each educational institution will make sure the learning resources used in the trials will be accurate and relevant to the course's topics	Each educational institution has designed their own courses according to their needs.

Table 6 Quality Assurance FLIP2G factors: Mandoulides Schools

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLIP2G objectives	Mandoulides schools is very invested in improving their

			knowledge on game based learning and innovative learning methods
	Administrative affairs	Administrative processes run smoothly across the consortium	The admin department of Mandoulides schools handles all necessary documentation and financial data for the organization
	Research	FLIP2G organizations' research teams are involved in PBL, flipped classrooms, LA, gaming environments	Mandoulides Schools is building a research team that will work on these matters
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	Mandoulides will exploit all FLIP2G project results in its courses
Technological	Development and sustainability of technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	The game and dashboard have been installed for Mandoulides using high security and privacy policies
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	The game includes different functionalities for teachers and students, such as quizzes, materials, tags, analytics for teachers and

			students and downloading of grades
	Accessibility	All members of the consortium will provide any relevant information required to the stakeholders for the successful employment of the FLIP2G results	Mandoulides is in constant contact with all stakeholders
	Interface design	The gaming environment and the LA dashboard's interface will be user friendly and simple in interacting with all features	All technologies for the project are user friendly and simple and can be used by primary and secondary education students
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	The detailed model and strategy allow teachers to design their courses using student-centered processes
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	The collaboration in the course is an important part of the model
	Social aspect	Students' active participation during classroom and within the game allow their socializing	Collaborative work to solve problems allow students to form social skills
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	Complete
	Assessment	Different quiz results and LA	Complete

		visualizations will be available for student assessment	
	Learning resources	Learning resources of various modes will be available in the FLIP2G game	
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	Mandoulides provides administrative support to their students
	Technical support	Technical student support is provided by each FLIP2G educational institution	Mandoulides provides technical support to their students
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	Mandoulides provides help to all teachers that need to install and use FLIP2G tools
	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	Mandoulides provides administrative support to their teachers
	Pedagogical support	Pedagogical support is provided by each FLIP2G educational institution	The researcher working for FLIP2G will collaborate and provide pedagogical support to teachers in Mandoulides
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization after the project's end	

	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	Pilot partners are conducting multiple trials
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	Yes
	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	Yes
Instructional design factor	Clarifying expectation	The design of all FLIP2G results has followed clearly defined learning objectives	Mandoulides created learning designs for its trials based on the FLIP2G learning model
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	Adjustments were made to the game for this reason
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	Yes
	Currency and accuracy of learning resources	Each educational institution will make sure the learning resources used in the trials will be accurate and relevant to the course's topics	Yes

Table 7 Quality Assurance FLIP2G factors: Revheim School

Factor	Sub-factors	FLIP2G context	Current status / remarks
Institutional	Institutional affairs	All consortium institutions' goals are in line with FLI2PG objectives	Revheim wants to learn more about working in bigger projects and being part of an international community. Being able to discuss and learn from various institution is regarded as highly valuable.
	Administrative affairs	Administrative processes run smoothly across the consortium	Revheim has a dedicated gaming pedagogue that focuses on handling the Flip2G project, meanwhile the principal shares the administrative load. The municipality also helps with the IT administration.
	Research	FLIP2G organizations' research teams are involved in PBL, flipped classrooms, LA, gaming environments	Revheim is testing out various methods for education within PBL, Flipped classrooms and gaming environments in lower secondary

			school.
	Reputation	The consortium's reputation will be improved through the exploitation of the FLIP2G results	The exploitation of the results will lead to an increase of reputation with the partners involved in the project with the richness of the data that the project produces within various relevant subjects for learning. It's reputation is already growing due to the projects ability to maintain a steady flow of social media posts, presentations on the project and research projects on underway. Revheim has attributed the project to it's success with using games as an integral part of it's curriculum.
Technological	Development and sustainability of technological infrastructure	The gaming environment and LA dashboard developed will be set up in accordance to privacy policies and high functioning technical specifications	Without proper privacy policies the project would be impossible to work with due to GDPR, so this is a high priority within the

			consortium and is seen throughout everything we do.
	Functionality of technological factors	The gaming environment and LA dashboard will include a variety of functionalities to support all stakeholders	Functionality across multiple devices and OS has been assured by Artelnics. Our Chromebooks works with both the teacher dashboard and for the pupils due to Unity being in a web browser.
	Accessibility	All members of the consortium will provide any relevant information required to the stakeholders for the successful employment of the FLIP2G results	Revheim and the other partners are committed to giving feedback and a bi-weekly meeting with all partners help facilitate discussions around feedback and how to move forwards.
	Interface design	The gaming environment and the LA dashboard's interface will be user friendly and simple in interacting with all features	Several changes has been made to the gaming environment and dashboard in accordance with user accessibility and feedback from partners.
Pedagogical factor	Student centeredness	The FLIP2G learning model and PBL strategy provide active participation and student-centred learning processes	The pupils are used to a varied strategies for learning and

			welcome the PBL strategy with games.
	Communication and interactivity	The FLIP2G learning model and PBL strategy allow interactions between students during problem solving	During the ongoing pandemic the structure of a typical classroom situation has changed and the introduction of online chatrooms to facilitate cooperation helps with problem solving in a PBL environment.
	Social aspect	Students' active participation during classroom and within the game allow their socializing	Pupils report that the Flip2G project has become a topic in which they discuss when they socialize as it is something they all participate in and feel very strongly about. Working with a common task or project helps socialisation.
	Learning environments	The FLIP2G game will be a learning environment with interactions, learning resources and learning activities	
	Assessment	Different quiz results and LA visualizations will be available for student assessment	

	Learning resources	Learning resources of various modes will be available in the FLIP2G game	
Student support	Administrative support	Administrative student support is provided by each FLIP2G educational institution	The assigned teacher at the school has administrative rights to the Flip2G admin page and admits pupils to the game. The teacher also provides help if pupils have forgotten their passwords or/and need help with the game.
	Technical support	Technical student support is provided by each FLIP2G educational institution	The pupils can ask the responsible teacher for help with IT.
Faculty support	Technical assistance in course development	Technical assistance to faculty is provided by each FLIP2G educational institution	Revheim has IT assistance from the IT department in the municipality which works normal working hours on all working days.
	Administrative support	Administrative faculty support is provided by each FLIP2G educational institution	The responsible teacher work together with the principal to help with administrative tasks.

	Pedagogical support	Pedagogical support is provided by each FLIP2G educational institution	There is an assigned teacher which provide pedagogical support and help for teachers involved.
Evaluation factor	Cost effectiveness	The FLIP2G results are developed within the project budget and will be sustained by each organization after the project's end	
	Learning effectiveness	Learning effectiveness will be achieved through multiple trials in different educational settings and re-design of results when necessary	Revheim will have pilots across four different classes with over a 100 pupils in lower secondary school to properly test the Flip2G Game and provide feedback for improvements.
	Student satisfaction	Student satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	In progress. A questionnaire before start and after will help to categorize which pupils are satisfied along with feedback during testing which will be noted.
	Teacher satisfaction	Teacher satisfaction will be achieved through multiple trials in different educational settings and re-design of results when necessary	In progress
Instructional	Clarifying	The design of all FLIP2G results has	

design factor	expectation	followed clearly defined learning objectives	
	Personalization	The design of the FLIP2G game has taken into consideration game design guidelines for secondary education students	
	Selecting proper learning scenarios	Learning scenarios for the FLIP2G game have been selected based on GBL guidelines	
	Organizing learning resources	Each educational institution will organize and upload their learning resources within the game for each trial	The pupils are able to access learning materials through Flip2G.
	Currency and accuracy of learning resources	Each educational institution will make sure the learning resources used in the trials will be accurate and relevant to the course's topics	Several teachers work with the assigned teacher to the project and provide valuable feedback for improvement and keeps the material relevant for the course.

3 SWOT Analysis

The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is adopted as a suitable method for performing project self-evaluation. In this section, we present the results of the SWOT analysis conducted by the consortium partners after 18 months of project work.

3.1 Applying SWOT in FLIP2G

The aim of the interim SWOT analysis is to validate and evaluate how the initial parameters that were identified in the initial SWOT analysis played and continue to play a part in maximizing the potential of the strengths and opportunities, while minimizing the impact of the weaknesses and threats. The details of the SWOT analysis process can be found in D7.1 “Quality Assurance Plan”.

3.1.1 Final internal SWOT analysis results

Internal analysis focuses on studying the strengths and weaknesses of the FLIP2G project.

The final SWOT analysis did not differentiate from the interim results. The overall SWOT analysis can be found in D7.2, while the summarized final view of the results as identified at the end of the project is as follows:

- Main strengths identified include the composition of the consortium as a mix of business and education representatives, the constant communication amongst partners through bimonthly telcos and the exchange of information during open WPs.
- Main weaknesses identified include inability to proceed to multiple testings of the technological solutions due to COVID-19 constraints, changes in initial objectives due to complexity and technical load efficiency and reduced dissemination techniques to the inability to participate in events because of the pandemic.
- Main opportunities identified include the novel combination of flipped classroom with PBL and serious games, which was positively received by the majority of the pilots and the increased motivation of learners from all educational levels to participate in the new self-directed learning process.
- Main threats identified include the lack of efficient technical infrastructure for a gaming environment which can cause frustration and limited participation.

4 Risk Management

This section illustrates the overall process for the risk management of the FLIP2G project. On the one hand, it provides a maintained overview of all individual activities and on the other hand, it determines the different procedures available to prevent risks from happening and for dealing with risks should they occur. Our risk management plan involves continually:

- **Measuring risk:** identifying what the risk factors are
- **Assessing risk:** estimating what is the probability and impact of these risk factors.
- **Monitoring risk:** analysing what is the current status of a particular risk
- **Managing risk:** preventing or handling risks.

The analysis of the risk management methodology can be found in D7.1 “Quality Assurance Plan”.

In the interim risk analysis, the consortium identified 27 risks for the overall project. These risks were taken into consideration during the second half of the project, and based on these risks, each partner filled out the e-quality framework for the project. The partners re-assessed the interim risks and maintained the Table that can be found in D7.2.

The most important risks that continued to be identified in the second half of the project are:

- Difficulty to create updated features of the game and to reduce the technical load balancing required.
- Difficulty in creating courses and incorporating content within the game for all audiences to apply to trials.
- Difficulty in disseminating project progress and results due to covid-19 restrictions in physical presence and events.
- Difficulty in completing project tasks due to covid-19 circumstances.

5 Peer Review of Deliverables

The FLIP2G consortium is committed to delivering results of outmost quality. For this reason the consortium decided to adopt a peer review process for all technical deliverables of the project.

5.1 Peer review process

5.2 Review report

For facilitating and formalising the review process a review report template has been prepared and is provided in Annex A of this document. This review report will be completed for each reviewed deliverable. It includes 3 sections: evaluation, recommendation and comments. Analytical details on the peer review plan can be found in D7.1 “Quality Assurance Plan”.

5.3 Allocation of reviewers

All technical deliverables of FLIP2G were peer reviewed, while only management deliverables (deliverables of WP7 and WP8) were excluded from the peer review process. The list of all deliverables subjected to peer review is available in Table 8. The table also includes the partner responsible for each review. For objectivity reasons, the review partner is always different than the leading partner.

Table 8. Reviewers and deadlines for FLIP2G deliverables

Deliverable	Leader	Nature	Diss Lev	Reviewer	Indicative dates due		Submission to EC
					To Reviewer	Reviewed	
D1.1 Review on serious games for education and training	Nurogames	Report	PU	Mandoulies	10/3/2019	15/3/2019	M3 (31/3/2019)
D2.1 Review of flipped classroom model	AAU	Report	PU	Northumbria	10/3/2019	15/3/2019	M3 (31/3/2019)
D.6.1 Dissemination plan and material	AAU	Report	PU	UOM	10/4/2019	15/4/2019	M4 (30/4/2019)
D1.2 Requirements for gaming environments in education and	Nurogames	Report	PU	Artelnics	10/9/2019	15/9/2019	M9 (30/9/2019)

training							
D2.2 FLIP2G flipped classroom model	AAU	Report	PU	UOM	10/9/2019	15/9/2019	M9 (30/9/2019)
D3.2 FLIP2G learning environment	Nurogames	Report & software	PU	Artelnics	07/06/2020	25/06/2020	M18 (30/06/2020)
D3.3 FLIP2G LA tools	Artelnics	Report & software	PU	Nurogames	07/06/2020	25/06/2020	M18 (30/06/2020)
D6.2 Interim Dissemination activities Report	AAU	Report	PU	Revheim	07/06/2020	20/06/2020	M18 (30/06/2020)
D6.4 Interim Exploitation and Sustainability Plan	AAU	Report	PU	Mandoulides	07/06/2020	20/06/2020	M18 (30/06/2020)
D4.1 Pilots plan	Northumbria	Report	PU	UOM	07/09/2020	27/09/2020	M21 (30/09/2020)
D5.1 Pilots evaluation plan	UOM	Report	PU	Northumbria	02/12/2021	08/12/2021	M36 (31/12/2021)
D5.2 Evaluation report	UOM	Report	PU	AAU	11/12/2021	15/12/2021	M36 (31/12/2021)
D6.3 Final Dissemination Activities	AAU	Report	PU	UOM	07/12/2021	07/12/2021	M36 (31/12/2021)
D6.5 Final Exploitation and Sustainability Plan	AAU	Report	CO	Artelnics	08/11/2021	06/12/2021	M36 (31/12/2021)

References

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