Co-funded by the Erasmus+ Programme of the European Union

NEW PEER
AUGMENTED REALITY APPS

N-Pear Augmented Reality Toolkit Plan

Final document

10 May 2023

Final document -

Date	Author	Reason
30/08/2022	Atlantic Team	Draft revision 1.0 of the toolkit plan
30/08/2022	Atlantic Team	Draft revision 2.0 of the toolkit plan
30/10/2022	Atlantic Team	Draft revision 3.0 of the toolkit plan
30/11/2022	Atlantic Team	Toolkit Plan Revision 4.0

Project reference: 2019-1-PT01-KA204-061388

- Coordination Atlantic Team -

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TOOLKIT N-Pear
Final plan 0.4

1 - TOOLKIT TEST PLAN:
N-Pear AUGMENTED REALITY

1.1 - Approvals:

Approved by:	Signature	Date
All partners	N-Pear Project	november of 2022

1.2 - Document control:

Name	N-Pear Augmented Reality
Doc. Ref. No.	0.4
Document status	Project
Issue date	September - November 2022

1.3 - History of changes:

Doc. Version	Author	Date	Description / Moving
01	All partners	Date	Summary of content or changes. Include reference to software/pedagogical change request IDs, if applicable, for effects of traceability.

1.4 - Distribution list

Name	Paper
Atlantic Team	Job description

2. **Objective**

The purpose of this document is to outline the testing strategy and general approach for the NPear Toolkit plan project. This includes test methodologies, traceability, resources as well as the customised schedule.

3. **Public**

The target audience for this document is the project research team and the project management team. The document is intended to fulfil its purpose for the intended audience only. The final NPear Toolkit Plan will be designed for teachers and all students who need and want to follow these same guidelines.

4. **Review history**

Review	Date	Updated by	Update comments
0.1	2022.08.30	Carla Silva [Atlântica Team]	Creation of the first document
0.2	2022.08.30	Carla Silva [Atlântica Team]	First draft
0.3	2022.10.30	Carla Silva [Atlântica Team]	Ready for review
0.4	2022.11.30	Carla Silva [Atlântica Team]	Final revisions

5. Introduction

This toolkit provides a structured path for *users* to learn how to use AR-related apps.

We invite you to use the Toolkit to analyse in class. Not all guidelines will be relevant to teaching and learning practices, and variations in individual practices mean that the number of guidelines demonstrated in lessons, courses and programmes will vary accordingly.

If your practice shows few or no examples of the guidelines in action, it could lead to the emergence of new possibilities for improving teaching and students' learning experiences.

Teachers can use this toolkit as a tool for reflection. For example, it can help teachers respond to student feedback or identify areas of practice that need professional development.

In a team context, the course organisation team could meet with the people involved in teaching the Moodle course to use this Toolkit. This activity can prove to be a useful catalyst for change and continuous improvement. An invitation to students to participate in this process can be an even more powerful vehicle for improvement. The Toolkit can also act as an aid in course or programme development and review procedures. Faculties could use the toolkit to recognise, discuss and share examples of good teaching and learning practice.

The Toolkit Guidelines Programme is the comprehensive and functional artefact for the quality assurance effort associated with the NPear Toolkit. Modification of this artefact can occur during the design and development phases, as examples, data and conditions are designed throughout the New Peer augmented reality application project process.

5.1 Test items

The main objective at this stage of the project is to check that all the applications have been defined. These pedagogical level tests will be included by technological and pedagogical level in our discussion groups.

- Integration test: This is a component-level test of individual units of the curriculum carried out by our development team. This design phase is intended to identify any immediate defects that may arise before the pedagogical programme is placed in the development environment.
- Functional testing: Functional testing is designed to check that each user level works as expected. The level of detail of the functional cases will ensure that the user interface works as expected, that the data is in the correct state as it is transferred from the media folders to the application and to the user.
- Performance and acceptance tests: This test consists of giving the application to a subset of the user population and letting them use the applications identified in this project. This testing phase is jointly coordinated by the NPear team and the development team and is carried out in the NPear environment.

5.2 **Relationship with other documents**

This section shows the relationship between the toolkit (fig1) and the other documents produced during development, such as the DAC - Requirements Analysis Document and the OOD - Object Design Document. It explains how all the tests are related to the functional and pedagogical requirements as well as to the system design indicated in the respective documents. If necessary, this section introduces a naming scheme to establish the correspondence between the requirements and the tests.

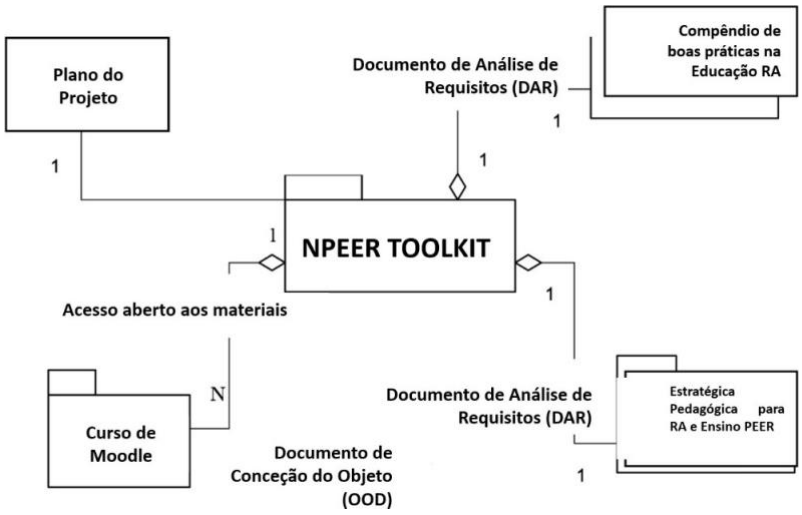

Figure 1 - Strategic technical/structural development plan for the NPear Toolkit

- This phase is related to the use cases and is developed from the use case in the RAD (Requirements Analysis Document - Model used by our discussion group to work, Requirements Analysis Document.

This model will develop the document *Compendium of best practices in educational AR* and is entirely structured to send information for the *pedagogical strategy of AR and peer learning.*

- Black box tests derived from functional or non-functional requirements are developed from the lists of pedagogical requirements in RAD to develop *the pedagogical strategy for the AR and peer learning* document.

- The structured analysis (unit/white box) will create the OCD (Object Design Document), which will lead to the overall Moodle Course and Open Access Materials. A visualisation of the relationships with the other documents can be seen in the diagram below.

5.3 These toolkit guidelines are based on assumptions such as:

- The app is available for IOS and ANDROID
- The application is available on IOS, ANDROID or higher
- The TOOLKIT NPear APP is tested and verified by an independent organisation
- The application runs on users' personal machines with different specifications and capabilities (OpenGL vs. DirectX, memory, graphics processors, etc.).
- The application will be installed via a free online programme
- Limited testability of models/levels (this does not include the XML file)

5.4 Characteristics and functions to be identified and required:

Main functions to be tested:

5.4.1 User interface and external interface

- Main menu
- Map visualisation tool
- Multimedia visualisation tool
- Installation and configuration application
- GUI/HUD in the game

NPear TOOLKIT will analyse the use cases, functional, technical and non-functional requirements and specifications identified to create curriculum cases, conditions and pedagogical data for NPear tests.

The QA test cases will include the following information:

- Data fields required for input into the user interface
- Data fields needed in the database
- Data fields for updating the database
- Data fields for updating the user interface

Data analysis for each test condition includes:

- Identification of existing data using current search capabilities

The expected results at a functional level will be defined and documented within APP NPear in the *Compendium of good practices in educational AR* and is fully structured to send information for the *pedagogical strategy of AR and peer learning*. It is hoped that these two documents will evolve as an APP NPear Online Course - Moodle during the Design Phase. Programmes will be written as development takes place.

5.4.2 **Create**
When the Toolkit's NPear analysis is complete, it will occur:

- Promotion of good information and training conditions, traceable to the functional and technical requirements, as well as the design artefacts implemented
- Execute test cases, record test results and validate existing data
- Characteristics defined for open-access online materials data

5.4.3 **Execute**

- Manual: All the courses in the programme will be written from a manual perspective, with the option of use, where possible, for all users.

6. HOW TO USE THIS TOOLKIT

You can start by selecting the teaching and learning practice to be analysed. In the space provided by each Guideline, write down an example of a teaching exercise or strategy from the course that recognises or uses the Guideline. If it is useful for your reflection, you can insert instructions for students or other material relevant to that particular exercise or strategy in a loose-leaf folder. If you don't have an example of practice for a particular Guideline, you can reflect on the following about why you don't (for example, the Guidance may not be relevant to the exercise or strategy in question) or what you can do in the future to incorporate this Guidance into your teaching as part of a continuous improvement strategy. There are many examples and suggestions in the material on each guidance page on the website or in the App. You may want to note any constraints that are preventing you from effectively applying the Guidance in your practice and consider whether these can be resolved. There is also space to note down resources and personal development opportunities to support you in applying the guidelines.

Note that the pages of this toolkit can be seen as models to be used in relation to various courses or practices.

7 Analysing the toolkit for augmented reality applications: New Peer

Purpose: The purpose of this document is to define, review and document possible improvements to existing applications (especially applications related to Physical Education) that will be completed to ensure that all Toolkit Guidelines are developed for project functions in a necessary and important way.

Objective

Online platform Included in the mobile application | Web platform available to the teacher
NO
Availability | IOS/ANDROID 3d models available Android, iOS
Free version
30-day free trial
Full version
$119/year
Description Supports the collaborative construction experience

Objective
< >

< >

In-line platform |NO

NO

Availability | IOS/ANDROID
NO
Android, iOS

Free version

With content limitations - 1 project allowed

Full version

From 25€/month

Description

< >

Objective
< >
< >

In-line platform |NO

NO
Availability | IOS/ANDROID AR Books Android, iOS
Free version
No limitations
Full version
N/A
Description < >

Objective < >
< >

In-line platform |NO
NO
Availability | IOS/ANDROID No HTML

Free version
14-day trial
Full version
From 19$/month

Description
< >

Objective
< >

< >

In-line platform |NO

NO

Availability | IOS/ANDROID
3D models available
HTML, Android, iOS

Free version
Analysis
Full version
500$ per school per year

Description
< >

Objective
< >

< >

In-line platform |NO

NO

Availability | IOS/ANDROID
3d models available
Android, iOS

Free version

Free trial with limitations

Full version

74.99$ per year/30-day free trial

Description

Build a 3D world and visualise it in AR mode on a surface.
It's more orientated towards 3D world design

Objective
< >

< >

In-line platform |NO

Application + browser support (Web AR)

Availability | IOS/ANDROID
NO
Android, iOS

Free version

Free trial with limitations

Full version

Prices not available

Description
< >

Objective
< >

< >

Mobile application| Included in the mobile application

Through the JigSpace application

Availability | IOS/ANDROID
3d models available
iOS

Free version

Free of charge

Full version

< >

Description
< >

Objective
< >

< >

Online platform|NO

NO

Availability | IOS/ANDROID
3d models available
Android, iOS

Free version

No limitations

Full version

< >

Description

< >

Objective

< >

< >

Online platform|NO

Application + browser support (Web AR)

Availability | IOS/ANDROID
3d models available
Android, iOS,HTML

Free version
10-day trial
Full version
99euros/month

Description
To activate an account, you need a phone number

Objective
< >
< >

Online platform|NO
NO

Availability | IOS/ANDROID
NO
Android, iOS

Free version
Free trial with 5 credits
Full version
49 euros/month

Description
Duration of publication 24 hours

Objective < >
< >

Online platform|NO
NO
Availability | IOS/ANDROID 3d models available Android, iOS
Free version
Free trial with 3 models
Full version
Price per model
Description Unlimited trial

Objective
< >
< >

Online platform|NO
NO
Availability | IOS/ANDROID NO Android, iOS
Free version
30-day free trial
Full version
55 euros/month
Description
Very slow processing when publishing. Unable to connect, error when viewing the application

8 Analysing the teaching activities of TOOLKIT New Peer Augmented Reality

Purpose: The purpose of these documents is to better define and monitor this project. Among the guidelines that will be completed to ensure that all the Toolkit tools created for the project's functions are required/designed.

Objective

Document	**Document**	**Document**
<List document>.	**<List document>.**	**<List document>.**

< Provide a description of the applications in the programme>

Reflection

< List all programme components >.

Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

< List the activities involved in drawing up the guideline >.

Staff development opportunities

< Adapt test reporting procedures based on size,
the complexity and specific needs of the project.

Don't forget to insert the instructions for students or other course material, if relevant.

Objective

Document	**Document**	**Document**
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< Provide a description of the applications in the programme>

Reflection

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Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

< List the activities involved in drawing up the guideline >.

Staff development opportunities

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Don't forget to insert the instructions for students or other course material, if relevant.

<Describe the monitoring process and information status of the activity>

Objective

Document	**Document**	**Document**
<List document>.	**<List document>.**	**<List document>.**

< Provide a description of the applications in the programme>

Reflection

< List all programme components >.

Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

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Staff development opportunities

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Objective

Document	**Document**	**Document**

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< Provide a description of the applications in the programme>

Reflection

< List all programme components >.

Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

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Staff development opportunities

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<Describe the monitoring process and the information status of the activity>

Act 13 - Learning can be enhanced and independent learning skills developed through the appropriate use of information and communication technologies.

Objective

Document	**Document**	**Document**
<List document>.	**<List document>.**	**<List document>.**

< Provide a description of the applications in the programme>

Reflection

< List all programme components >.

Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

< List the activities involved in drawing up the guideline >.

Staff development opportunities

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<Describe the monitoring process and information status of the activity>

Act 14 - Effective learning is facilitated by assessment practices and other student learning activities that are designed to support the achievement of desired learning outcomes.

Objective

Document	**Document**	**Document**
<List document>.	**<List document>.**	**<List document>.**

< Provide a description of the applications in the programme>

Reflection

< List all programme components >.

Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

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Staff development opportunities

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<Describe the monitoring process and information status of the activity>

Act 15 - Meaningful and timely feedback to students improves learning.

Objective

Document	APP	Date
<List document>.	**<Name of the APP in the list>**	**<Use the mm/dd/yy format to document the date of the reference>**

< Provide a description of the applications in the programme>

Reflection

< List all programme components >.

Restrictions on the application of this guideline

Test material - identify the additional test materials made available to each of the participants in the test.

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