EU HORIZON 2020 Project

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Networked labs for training in sciences and technologies

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AACE

EdMedia + INNOVATE LEARNING

AMSTERDAM
JUNE 25-29, 2018

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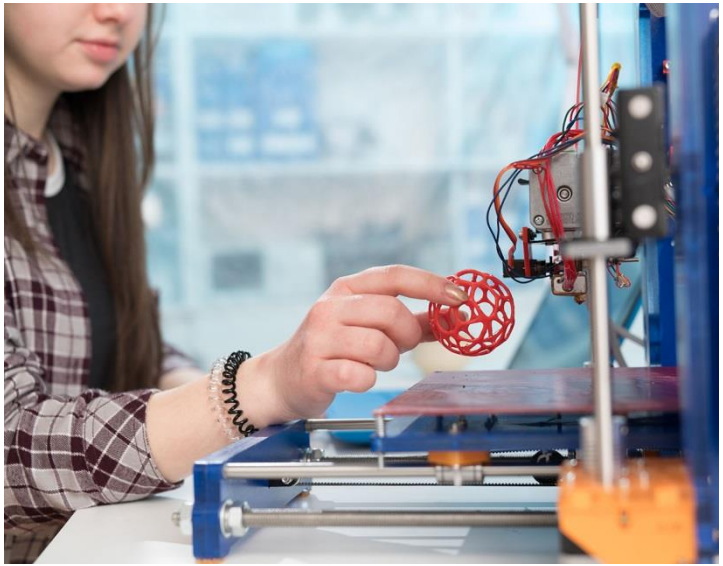
Virtual Presentation

Multi-dimensional Approach for the Pedagogical Assessment in STEM Technology Enhanced Learning

Lydia Montandon, Jim Playfoot, Ioana Ghergulescu, Marilena Bratu, Diana Bogusevschi, Renata Rybarova, Nour El Mawas

Content



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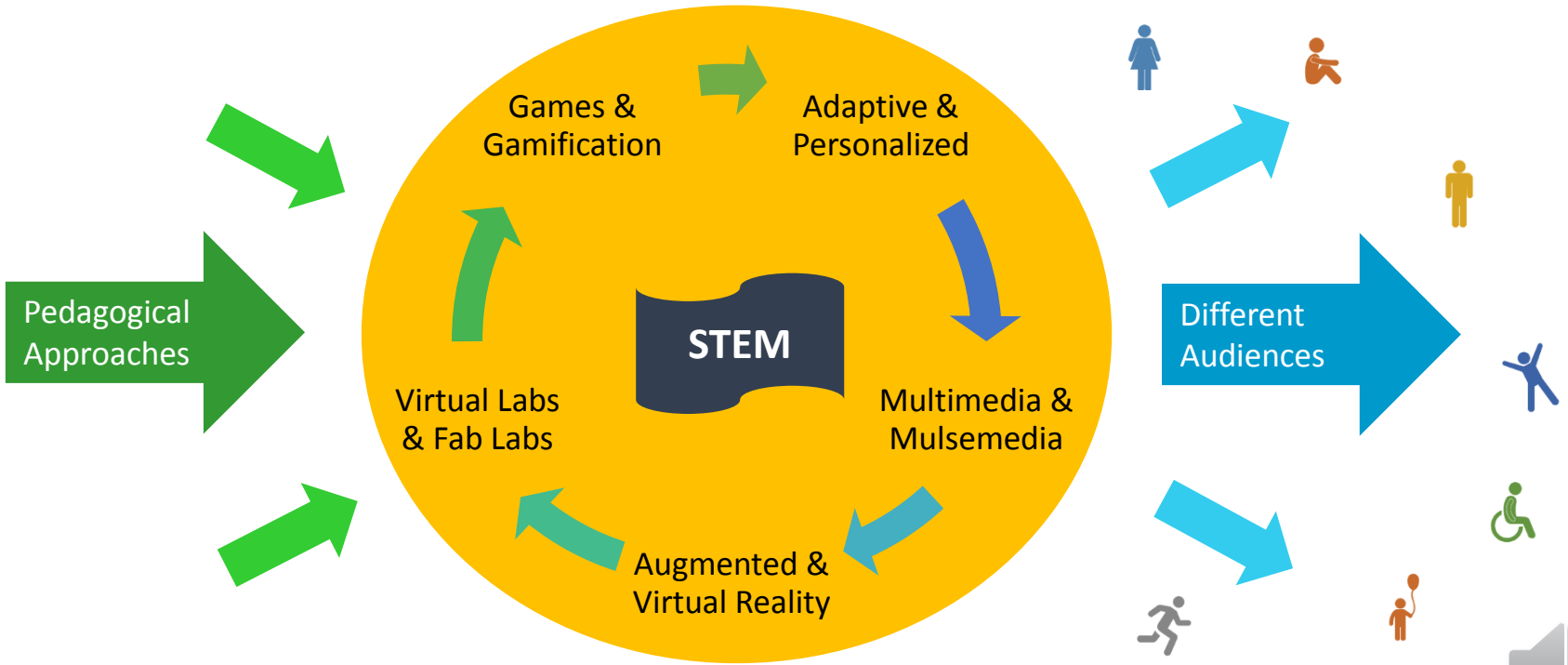
1. Introduction

What is NEWTON?

NEWTON MULTI-DIMENSIONAL APPROACH FOR THE PEDAGOGICAL ASSESSMENT IN STEM TECHNOLOGY ENHANCED LEARNING



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NEWTON Pilots

- Pilots in different
  - Countries
  - Types of organizations
  - Study level, learner age
  - Classroom settings
  - Educational needs
  - STEM contents
  - Technologies
  - Pedagogical Approaches

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Pedagogical Assessment

NEWTON MULTI-DIMENSIONAL APPROACH FOR THE PEDAGOGICAL ASSESSMENT IN STEM TECHNOLOGY ENHANCED LEARNING

- Theoretical Framework
  - Multiple dimensions
  - Literature review
- Methodology & Work Plan
  - Guidelines
  - Toolkit & Templates
  - Webinars
  - Permanent Support

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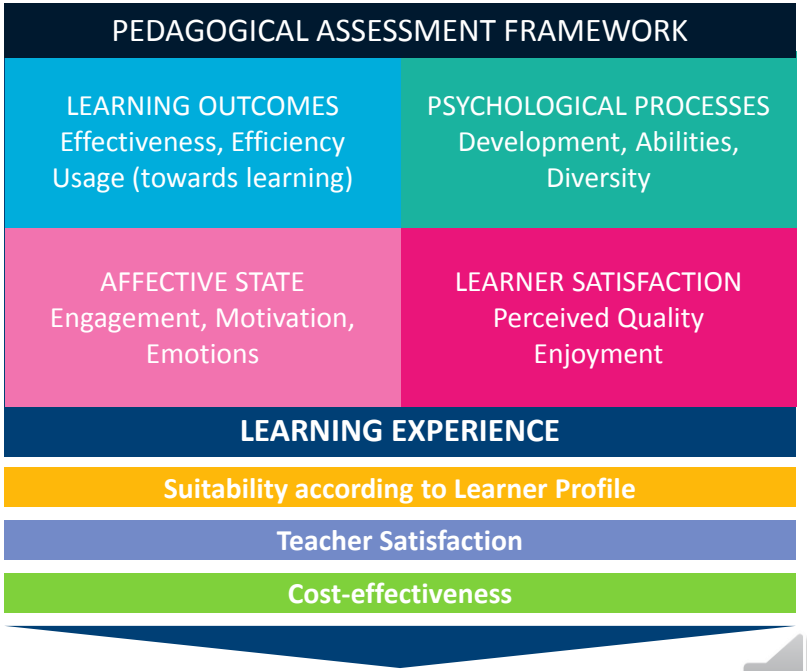
2. Methodological Approach

Theoretical Framework

- Multi-dimensional
  - Subjective data
  - Objective data

  - Learner perspective
  - Teacher perspective
  - Institutional perspective



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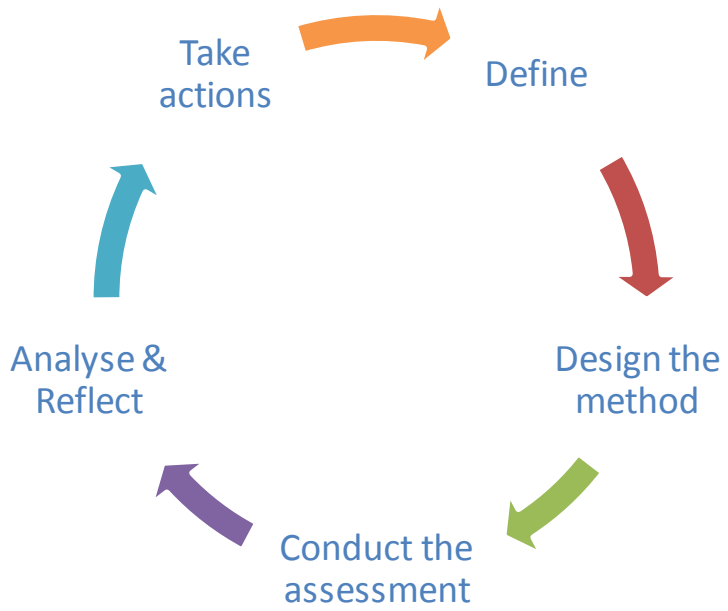
Iterative approach

- Start with the definition of
  - Evaluation goal
  - Research question/s
  - Expected learnings from the evaluation
  - Tools to be used (from the toolkit)
- Conduct the Assessment
- Analyze the results
- Action recommendations to the pilot and the research community



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Pilots Workflow

Prepare local research team

- Guidelines & Toolkit
- Webinars & Training

Contact Institution

- *Love Letter*
- Standard Presentation
- Teacher Engagement
- Teacher Survey (pre)

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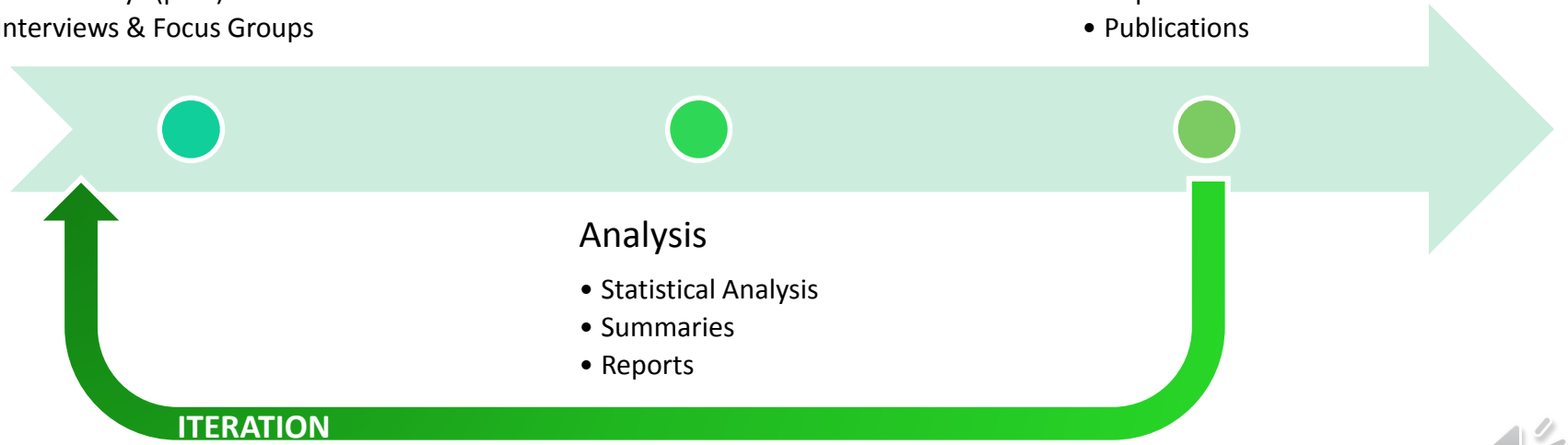
Pilots Workflow

Run the Pilot

- Presentation & Initial surveys (pre)
- Observation & Tests
- Final surveys (post)
- Interviews & Focus Groups

Outputs

- Recommendations
- Feedback
- Impact assessment
- Publications



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Messages to teachers!

- **We need their ideas** – help us develop the learning content
- **We need their teaching skill** – to deliver NEWTON content
- **We need their evaluation expertise** – help us understand our impact, specifically…
  - Evaluating skills & knowledge acquisition in students
  - Evaluating learner engagement & motivation
  - Evaluating the impact on them!

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We will be evaluating…

- Achievement of learning objectives
- Progress towards specific learning targets
- Proving learning retention
- Enjoyment of the learning experience
- Attractiveness towards the technology
- Level of engagement in learning
- Usability within the classroom
- Practicality within the school
- Connection to pedagogy
- Requirements for training
- Change of teacher role
- Response of school management team

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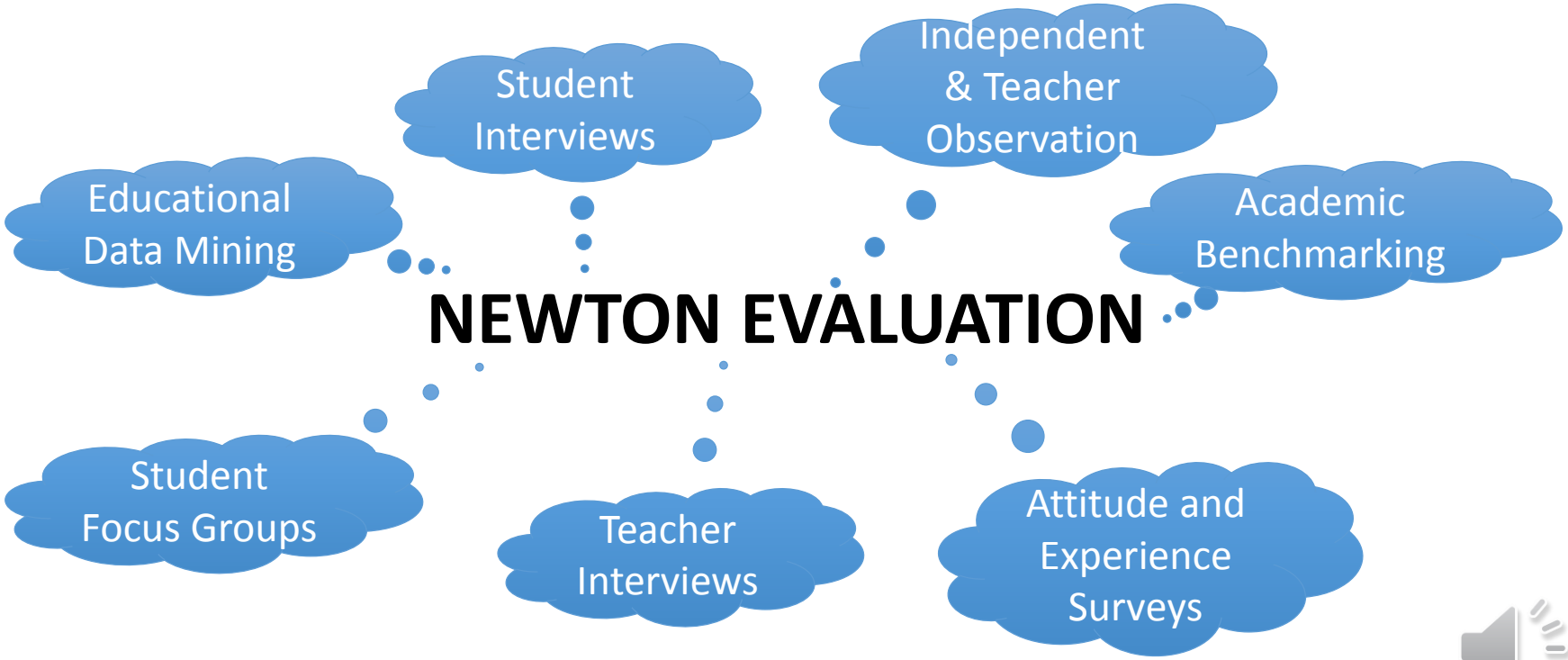
3. Pedagogical Assessment Toolkit

Overview of evaluation tools



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Data gathering from LEARNERS

1. Surveys / Questionnaires & Tests
2. Interviews
3. Focus Groups
4. Observational Assessment
5. Data automatically gathered by the platform

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Data gathering from LEARNERS

Surveys / Questionnaires & Tests

- 3 stages **before**
  1. Demographic Questionnaire (~5')
  2. Knowledge Test
  3. Affective state regarding traditional science classes (~5')
- 3 stages **after**
  1. Affective state & attitude regarding STEM (~5')
  2. Usability Evaluation (~10')
  3. Knowledge Test

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Data gathering from LEARNERS

Surveys / Questionnaires & Tests

- It is important to respect the order of stages
- It is important for all pilots to follow a similar approach when designing knowledge tests (same module = same test)
- Questions may be translated to the local languages, but codification /question order should be respected
- Local Researchers ensure that the Learner NEWTON single ID is associated to each questionnaire

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Data gathering from LEARNERS

Focus Groups, Interviews & Observational Assessment

- Aiming to understand:
  - Nature of student experience of NEWTON
  - Impact of using NEWTON to the learning experience and students
  - What can be done to improve student experience and learning outcome
- Focusing on:
  - Learning experience
  - Usability

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Data gathering from LEARNERS

Data gathered by the NEWTON Project platform (NEWTELP):

- Components send information to NEWTON Project Platform Learning Record Store (LRS) using TIN-CAN standards
  - Keeping track of the outcome of the activity
  - Keeping track of the duration
- Ideally pre-test and post-test knowledge given within the NEWTON Project platform

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Data gathering from TEACHERS

1. Surveys / Questionnaires
2. Interviews and / or Focus Groups
3. Observational Assessment

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Data gathering from TEACHERS

Surveys / Questionnaires

- Pre-NEWTON Survey
- Post-NEWTON Survey

- Demographics
- Use of technology in the classroom
- Teaching practice
- Learner Satisfaction/Motivation

+ Follow-up phone calls weeks after to check if changes can be noticed in Learners' attitude

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4. Pilot Deployments & Feedback

Pilot Deployments

- Communication tools and collaboration practices > **knowledge sharing**
- PAC virtual meetings every week!
- Permanent support to NEWTON (FAQs & lessons learnt fed back to the community)
- Encouraging internal & external communication (templates, guidelines, …)

Title	Pilot Name	START
Dates	Publication date: dd/mm/yyyy	Pilot Start date: dd/mm/yyyy
Context	Organization, City, Country	Education level (HE, primary, age…)
Scale	Small Scale / Large Scale	Pilot Duration: 00:00 (hours of study)
Goal	Hypothesis, what are you piloting, expected outcomes, etc. (2-3 lines)	
Learners	Numbers of participants in Experiment Group / Control Group (if relevant)	
SEN	Indicate number and type (e.g. visual, hearing, impairment)	
Techno	e.g. AR, VR, Multimedia	
App	Wildlife 1/2, Final Front	
Tweet START	Launching tweet: indica @newtonprojecteu!...2 characters description 2	
Contact	Name and email of cont	

Q … Can you just specify what do you intend for "data shared with NEWTON Community"?

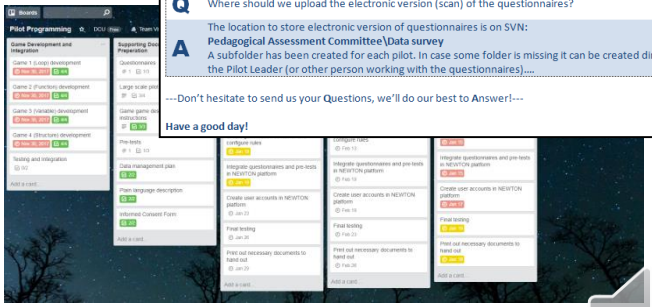
A by sharing data with the Newton community is meant to provide scanned questionnaires for processing and analysis. If you have already electronic version of your questionnaires you can upload it to SVN or somewhere else and notify Kybertec. KTEC is responsible for processing the data (store it in the database, analyse it, etc.).

Q Where should we upload the electronic version (scan) of the questionnaires?

A The location to store electronic version of questionnaires is on SVN:
Pedagogical Assessment Committee\Data survey
A subfolder has been created for each pilot. In case some folder is missing it can be created directly by the Pilot Leader (or other person working with the questionnaires)….

---Don't hesitate to send us your Questions, we'll do our best to Answer!---

Have a good day!



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Templates: What for?

- ***Pilots General Table and Timeline***
  - quick an easy overview of passed and future pilots, including Trello links
- ***Pilot Planning Report***
  - valuable input and guidance for all future NEWTON project pilots
- ***Pilot Results Report***
  - drawbacks and benefits of each pilot and NEWTON project application
  - perform necessary adjustments

Pilot Planning and Pilot Results reports will be the first step in ***disseminating*** NEWTON project results

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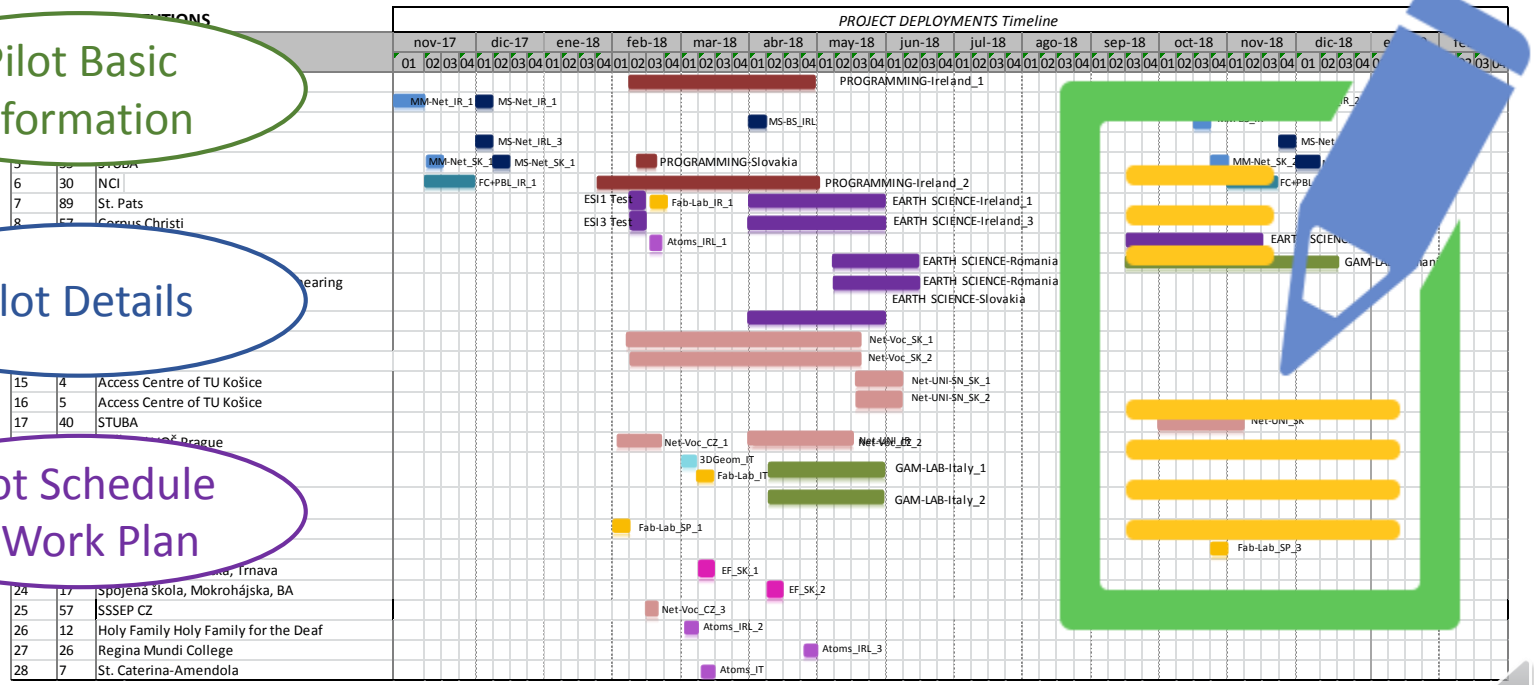
Templates: Pilot Planning

NEWTON MULTI-DIMENSIONAL APPROACH FOR THE PEDAGOGICAL ASSESSMENT IN STEM TECHNOLOGY ENHANCED LEARNING

Pilot Basic Information

Pilot Details

Pilot Schedule & Work Plan



6	30	NCI
7	89	St. Pats
15	4	Access Centre of TU Košice
16	5	Access Centre of TU Košice
17	40	STUBA
24	17	Spojená škola, Mokrohájska, BA
25	57	SSSEP CZ
26	12	Holy Family Holy Family for the Deaf
27	26	Regina Mundi College
28	7	St. Caterina-Amendola

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Pilot Result Template

Introduction

- Scenario Description
- Participants Description
- Testing Description

Analysis

- Learning outcomes
- Questionnaires
- Quality Assessment
- Focus Groups & Interviews with Learners
- Observational Assessment
- Focus Groups & Interviews with Teachers
- Special Education Needs Assessment

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Why use templates?

- Effective collaboration between all pilot leaders and Pedagogical Assessment Committee (PAC).
- Enable PAC to update and adjust the assessment procedure if necessary.
- Small-scale pilots will feed into large-scale pilot plans.
- Easy access to pilot information for all partners.
- Efficient dissemination strategy.

☺ Share, Share, Share ! ☺

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5. Conclusive Remarks

Main points

- Ensure close cooperation with schools and teachers. Make them understand:
  - What the project is about
  - What is their role in the pilot
- Familiarize the team with the assessment tools and ask researchers to make a very precise planning for the evaluation part of the pilot
- Use templates for standard reporting and comparative analysis
- Analyze results and share lessons learnt, communicate, recommend, publish, …. make others benefit from the learnings
- Keep a close contact with the PAC at any time (virtual support)

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6. Acknowledgement & References

Horizon 2020 NEWTON Project
Partnership

NEWTON MULTI-DIMENSIONAL APPROACH FOR THE PEDAGOGICAL ASSESSMENT IN STEM TECHNOLOGY ENHANCED LEARNING

14 partners

7 countries

60% Industry

40% Academy

Coordinated by DCU

March ‘16 – Feb ‘19

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This work is dedicated to teachers and teaching organizations willing to engage learners in STEM education

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Questions?

- Contact us via our personal emails
- Find other NEWTON presentations in the EdMedia conference program
- Contact us via our twitter account @newtonprojecteu

- Check our website and blog for updates **www.newtonproject.eu/blog**

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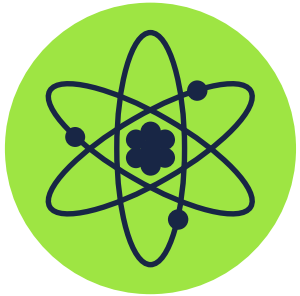

Thank you