DUCK project

KA2 Strategic Partnerships – 2018-1-HU01-KA202-047809

EXECUTICE SUMMARY

NEEDS ANALYSIS, BEST PRACTICES AND TOOLKIT REPORT
Collated results from the country reports from Hungary, Iceland, Spain and Poland

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@duckerasmus

EXECUTIVE SUMMARY

This study aims to **map the state-of-the-art in data understanding and communication teaching methods in the consortium partner countries and at EU level.**

The **findings will feed into the Data Understanding and Communication (DUC, from now on) course (O2), development of sector specific activities and examples (O3), Lessons Learned Kit** (LLKit from now on) **and guidelines (O4) and the on-line resource center and learning portal (O5).**

The activities leading to the elaboration of this report were implemented from November 2018 until September 2019. They were implemented by teams in the partner countries in ICELAND, Hungary, Spain and Poland.

This report follows the instructions of the "*DUCK O1 Overall Methodology*" planning document. In this frame, a specific desk and field research was implemented in the 4 countries involved:

- Desk research involved the review of national and regional legislation and state of the art report included in chapter one: desk research.
- Field research involved the implementation of interviews, online survey and focus groups that are included in chapters 2, 3 and 4 of this report.

Regarding the summary of desk and field research:

As regards, **policy level and practices**, there are no specific policies related to training or up skilling for teachers, trainers and university professors regarding specifically data understanding and communication in ANY OF THE countries researched. However, in Poland it is assumed that the graduate has the skills of critical thinking at Level 6 (BSC, Eng.) and Level 7 (Master), which corresponds to European Qualification Framework.

Continuing professional development of teachers and professors in the countries involved reflects that education authorities are responsible for planning, organising and recognising continuing professional development within their jurisdiction providing teachers with a wide range of activities.

In Hungary, there are courses that teach qualitative and quantitative methodologies: probability theory, statistical uncertainty, randomness is part of courses like technical management. Besides this, HE has general statistics in *Quality management and business statistics* programmes: there are 14 BSc programs and 6 MSc programs. Quantitative statistics are taught in average 4 classes per week, qualitative analyses belong to the quality management classes. The Educational Authority employees at present attend a course on data visualisation, using Power BI by Microsoft that is the most widespread app for data visualisation, usually used by the industry. Their 50 hour course however was open to people with specific background (analysts, colleagues working with big data, ICT people).

In Iceland, Continuing Education University of Iceland is the biggest provider of continuing education courses in Iceland and offers a wide range of courses and study programs. By a review of the course offering, four courses were identified, that specifically covered communication of quantitative data. Three of them, were courses in using Microsoft Excel, at incremental levels of complexity, while the fourth was a course on Microsoft Power BI.

In Spain, continuing professional development activities consist of regular actions for the updating of their scientific, educational and professional expertise. Participation is voluntary. Priority guidelines for 2018 (ES Ministry of Education Culture and Sports, 2018) on continuing teacher training plans are annually established through the Spanish Institute for Education Technologies and Teacher Training (INTEF) but do not include Data Understanding and Communication related contents.

In Poland, in the field of CPD the educational offer in the field of data analysis and presentation offered either by training companies and universities is rich and varied in terms of content and level.

Field research in the form of surveys, interviews and focus groups provided a wide array of target group needs that the future DUCK course hoped to tackle. It was universally agreed that an introductory course is missing and needed. Users who use data in any capacity need to be able to understand the relevant fundamentals, including the importance of data understanding and communication.

The words that were most used by the participants in the interviews, survey and focus group were: (make it) *attractive for teachers and learners, (keep it) short and focused, (try to be) flexible, (make it) practical and connected to real life, and connected to teachers and students' needs.*

Key recommendations include the following:

- Make it short and attractive. The most common concerns about the course are the time (that is the course being too long) and the attractiveness of the course.
- The target groups may vary in their mathematical knowledge as well as their savviness in different applications: use basic math and widely available software in the examples.
- Make the learning as flexible as possible in order to be as adaptable as possible to the learner
- Try to reflect the benefit of the learning and the potential of increased employability
- Make emphasis on real life examples and a clear applicability and adaptability to the contexts. Make area-specific examples available for the teachers to apply
- Foster the development of critical thinking
- Foster the development of creative thinking

The following table illustrates the content proposed for the course development. It was recommended that difficulty grading could be encouraged: each stage could contain all elements at the same time (problem formulation, analysis, presentation of results) configured on a given difficulty level, not separately individual elements in the first level system - problem formulation, second level - analysis, etc.

	UNITS	KEY ASPECTS	ALSO TO BE CONSIDERED
1. PROBLEM ANALYSIS	1.1 IDENTIFY THE ISSUE	1.1.1 Identify the issue	Distinguish between types of issues
	1.2 STATE AND REFINE THE ISSUE	1.2.1 Correctly recognize the type of question	Choose the best type of question for a given problem
		1.2.2 Formulate the question of a given type	
	1.3 PRECISELY DEFINING TERMS AND OBJECTS	1.3.1 Identifying ambiguities	Making definitions more precise

	UNITS	KEY ASPECTS	ALSO TO BE CONSIDERED
2. DATA COLLECTION AND ANALYSIS	2.1 PREMISES AND ASSUMPTIONS	2.1.1 Distinguish conclusions, premises and reasons	Identifying and evaluating assumptions
		2.1.2 Evaluating source reliability	
	2.2 REASONING	2.2.1 Being able to efficiently analyse simple data	Knowing key categories of disputes
		2.2.2 Knowing reasoning strategies	Knowing reasoning fallacies
	2.3 ARGUMENTS ARCHITECTURE	2.3.1 Know the main steps of analysis	Organise the argumentation
		2.3.2 Constructing the argument	

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	UNITS	KEY ASPECTS	ALSO TO BE CONSIDERED
3. COMMUNICATION	3.1 CORE COMMUNICATION SKILLS	3.1.1 Identifying the best possible visualisation type for a give data/problem type	Knowing the core concepts of data communication
			Choosing the best communication method for a given goal
	3.2 WRITING	3.2.1 Making definite claims and proposals	Writing good leads
		3.2.1 Writing out arguments	Detailing and meeting objections
	3.3 ORAL PRESENTATIONS	3.3.1 Define the issue the activates the mind of the audience	Reaching out to audience
			Using visual aids
		3.3.2 Signposting arguments	Getting and using feedback
			Ending in style

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