Daniela Vono de Vilhena

Simulation tool: young audiences

Deliverable 11.6

QuantMig has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 870299.

History of changes

Version	Date	Changes
1.0	07 July 2023	Issued for Consortium Review
1.1	10 July 2023	First version submitted as official deliverable to the EC
1.2	01 November 2023	Second version submitted after final QuantMig Review Meeting

Suggested citation

Vono de Vilhena D (2023) Simulation tool: young audiences. QuantMig Project Deliverable D11.6. Southampton: University of Southampton.

Dissemination level

PU Public

Acknowledgements

This document reflects the author's view and the Research Executive Agency of the European Commission is not responsible for any use that may be made of the information it contains.

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Table of Contents

1. Introduction

D11.6 – Simulation tool – young audiences is a formal deliverable on WP11, due in month 36 (postponed to month 42).

The deliverable is formed by two different products: 1) a Migration Quiz, and 2) Teaching Materials.

2. Migration Quiz

The Migration Quiz is now available at Population Europe and QuantMig Websites:

- https://population-europe.eu/resources/migration-quiz
- https://www.quantmig.eu/project_outputs/migration_quiz/

This is a simple and straightforward quiz about the proportion of foreign-born individuals living in European countries in 2020, and the proportion that is expected to be found in 2050 according to QuantMig's microsimulation population projection model and migration scenarios for 31 European countries. It was designed to create a quick and effective way to engage users to further explore our teaching materials, but it is also very effective in provoking the curiosity of more senior users to further explore QuantMig deliverables.

To ensure users understand the numbers presented are only estimations, we have included the following warning: "Remember: in the quiz, all migration numbers are only approximate. In reality, all estimates and future scenarios come with errors. The statements about the future are particularly uncertain: we know much less about what will happen in 2060 than about what happens now. The numbers in the quiz show our best guesses about migration now, and how we imagine the future might look like if the current migration trends continue".

Users start by responding in which country they live. They are then asked: What do you think was the percentage of foreign-born people living in XCOUNTRY in 2020? There is no right or wrong reply from our side. If the answer was "wrong", the user will get a message "Interesting! We

estimate it was …. As the numbers presented are the best approximation to reality, but still an approximation. Following, there is a question about how things may change by 2050, and again the answer is presented in a user-friendly way. To conclude, we ask for the age group of the user and invite them to guess what is the proportion of foreign-born people of their age group living in the chosen country.

The content of the Quiz is a result of a collaboration among different partners at the QuantMig consortium, and the data used for it is publicly available at QuantMig's Data Repository at Zenodo - https://zenodo.org/communities/quantmig?page=1&size=20 .

Below, the structure of the quiz is presented:

3. Teaching Materials

3.1 Preparation

To prepare for the development of the Teaching Material deliverable, we began with a comprehensive sweep of existing teaching materials and best practices that we would like to have represented in our work. This was also to ensure that our teaching materials found a unique niche. During this research phase, we looked at school material databases such as the School Education Gateway, The European Union's Learning Corner and IOM, among others. Specific materials that were of interest included Ties' 'Why do people migrate Migration drivers and mechanisms', IOM's 'World Migration Educators' Toolkit' and the European Commission's 'EU & me'. Additionally, we began looking into a number of digital learning tools that could facilitate innovative and engaging teaching opportunities. The mediums for the materials we choose can be found in the 'Materials and Corresponding Formats' Section of this document.

Throughout the early stages of this concrete product, engaging with the QuantMig Team was crucial, which included presenting the progress at consortium meetings and holding smaller meetings with the Teaching Material Committee which included Jakub Bijak (Project Investigator), Marta Bivand Erdal, Daniela Vono and Mahalia Thomas. In a meeting on 11 March 2022,

committee members discussed interesting case studies and goals of the teaching materials and determined the topic and target group. On a second meeting on 27 May 2022, the mission and goals were finalised as well as the topics and components of the lessons. This prepared us to undertake the writing of the teaching materials during the summer of 2022.

3.2 Topic & Audience

The topic we choose for the teaching materials is 'Migration & Migration Uncertainty'. This was chosen due to three reasons. First, migration-based teaching materials are very common and tend to fall into two categories: (1) awareness raising often aimed at a younger audience and (2) scientific/quantitative exercises often for an older audience. Given that the core of QuantMig's research is the quantitative aspect of migration, we would naturally fall within the latter category. Second, what emerged early through conversations is the goal to give students ownership of the work they would do through the teaching materials as if they were scientists themselves. This led to a strong emphasis on focusing on Maths, specifically statistics.[1] Lastly, by focusing on uncertainty within migration, we sought to provide a new vantage point to explore migration, one that could have repercussions on students' thinking on uncertainty on topics other than migration such as climate change, the economy and others.

With the goal of having students take the role of scientists, we recognised that students would need to have a certain level of critical thinking and analytical skills. This led us to conclude that our target audience group should be 10th to 13th graders (depending on where they live). The added benefit for these students is that the understanding they have of a specific case study of migration could easily translate into a larger research project that could be helpful for university applications, demonstrating analytical skills during the job search and for larger-scale projects often conducted close to graduating from high school.

3.3 Missions & Goals

The mission of the teaching materials goes as follows:

> *Allow students to take the role of scientists as they examine migration uncertainty at the macro and micro levels.*

This mission statement was chosen because it encompasses the three main components of the teaching materials: (1) ownership of their own work, (2) migration uncertainty and (3) looking at both the macro and micro levels of migration uncertainty. Through this, students will be able to fulfil the following goals of the materials:

[1] In our research, there is one set of migration teaching materials focused on Maths. However, this is aimed at a much younger audience and would not conflict with our materials.

1. *Learn about the possibilities of knowledge on migration and its limits – and push the boundaries of both.*
2. *Create a country-specific report examining migration uncertainty in one country, and explore comparative aspects.*
3. *Utilise quantitative skills in examining migration uncertainty.*

As uncertainty within migration will always exist, the goal of the teaching materials is not to give students the sense that it can be solved. Rather, the goal is to explore a statistical way to look at migration, what the limits to such studies are and how research can push the bounds of what we can know on the topic. The students will also learn to appreciate the high level of migration uncertainty and the challenges it poses for research and policy. Throughout the teaching materials, students work intensely on one country, which is used in all exercises in the workbook. This allows students to have ownership of the country and create a sense of responsibility during the comparative aspect of the teaching materials where students aggregate their findings and analyse them. Lastly, students develop and strengthen statistical and analytical skills that can be implemented in other fields of research.

3.4 Materials and Corresponding Formats

There are four types of materials developed, which include lesson plans, a workbook, slides and the data necessary for the exercises. In the choosing of the medium of these materials, accessibility and interactivity guided our decision-making. We define accessibility here as both accessible in terms of disabilities such as those requiring text-to-speech aids as well as lowering the technological barrier to ensure that students regardless of means will be able to access them. For interactivity, we sought to create a novel experience for students to engage with migration and migration data through the inclusion of gamification elements.

All materials – including the Migration Quiz – are accessible at one page on QuantMig's website: http://www.quantmig.eu/project_outputs/teaching_materials/ .

Teaching Guide

This material is downloadable as PDFs and presents all the information necessary for the teacher to prepare and conduct the sessions. PDFs allow for easy downloading and access as all browsers provide a PDF reader. This guide gives teachers an oversight into what awaits their class in these lessons, offers solutions for a flexible use of these materials and goes into the nitty-gritty of their implementation. We begin with some general information about the materials and then provide two-pagers for each lesson for teachers to print out and reference while teaching.

Workbooks

The workbooks are presented as interactive PDFs and were inspired by the European

Commission's 'EU & ME' Activity Book. What this entails is that they can be used in multiple ways such as being printed out or being typed directly into. They are divided into five sections corresponding to the five lessons. Each section includes the learning goals, a summary of the slides, key terms, space to reflect on the reflection question and group discussion, maths exercises and country-specific and comparative analysis.

Slides

As much of the work in the lesson plans will be guided by quantitatively looking at migration, it was crucial for us to find a software that allows users to visualise data in an engaging and hands-on way. We ultimately decided on using Prezi, specifically Prezi Present, which allows for the creation of slides with interactive graphs and tables. Here students can compare different samples, remove observations, isolate data points and sort data by clicking on the slides. As Prezi presentations are hosted on their website, teachers and students do not need to download anything to access them. They can simply click on the link and start the presentation.

Data

Students are asked to work with data to draw conclusions about the state of migration in their chosen (or assigned) country. The data comes from freely available online sources such as Eurostat. Our goal here is also to develop longevity as the websites are updated over time. This is in contrast to providing data in spreadsheets that will not be updated beyond the end of the QuantMig project. Additionally, for Lesson 3, we cannot assume that all students use the same spreadsheet tool, so we have included both Excel and Google Sheets, as these are the two most commonly used tools in schools that they may use to complete the lesson.

3.5 Lesson Components

To fulfil the previously mentioned goals, we developed a four-component structure for the teaching materials that would be used in every lesson. This allows us to tell a story from key definitions to personal reflections and from known quantitative patterns to those that students will uncover themselves.

Part I: Introduction (15 minutes)

The first part introduces students to the topic of the lesson guided by an overarching question specific to the topic. These questions can be found in the 'Lessons Topics' of this document. During this part, students are asked to discuss questions as a class, cover important terminology, complete verbal exercises and explore data. For this last aspect, students explore data visualisations in the form of maps, pie charts and bar graphs for both the European and country-specific levels. In the workbook, Part I is reflected in a one-page spread with all terminologies from the slides. Knowing they do not need to copy down these terms will save time and allow them to focus on the class discussion.

Part II: Reflection (10 minutes)

The second part of each lesson focuses on a discussion question specific to the topic. These

questions can be found in the 'Lessons Topics' section of this document and ask students to reflect on their own thoughts on migration. This also acts as a primer to begin to think about the themes explored in the Maths section (Part III). Here, students are encouraged to explore the question on their own for 5 minutes, followed by a short debrief in the class. In the workbook, students can find the question and the space to answer.

Part III: Maths (20 minutes)

Each Maths section is based on the guiding question for that lesson and allows students to explore their chosen country. Knowing that a quantitative scientist's work often expands to the realm of policymaking, lessons 4 and 5 are focused on analysing existing reports – including from the Eurobarometer and the European Labour Authority – and to provide policy areas and recommendations. In the workbook, this section is divided in three parts: (1) background information, (2) instructions and (3) space to complete exercises and/or answer questions.

Part IV: Data in Comparison (15 minutes)

The final part of each lesson brings the work that the students have done in their individual countries together. For lessons 1 to 3, they are asked to combine their work and look at aggregate patterns through data visualisation. For lessons 4 and 5, they discuss their findings from the previous section to explore similarities and differences as well contextualise their countries in the larger European arena. This section is represented by a set of short answer questions in the workbook.

3.6 Lessons Topics

Lesson 1: Migration & Migration Uncertainty

The first lesson introduces students to the topics of migration and migration uncertainty. The idea of uncertainty will be a key theme throughout all of the lessons and will show students how uncertainty is a natural part of the social sciences and how we can use flexible thinking and techniques to develop research results and recommendations. This lesson will also introduce the key concepts that will be used in the following lessons and allow students to think reflectively about their existing opinions and knowledge on the topic.

- **Guiding Question:** What is migration and what do we mean by migration uncertainty?
- **Terminology**: Aleatory, Epistemic, Migration, Migration Uncertainty, Pull Factors, Push Factors and Shock Events.
- **Reflection Question:** What are some potential shock events that could occur in the future and how do you think they would impact migration?
- **Maths Exercise:** Calculating percent change to predict future immigration.

Lesson 2: Micro-Level Decision-Making

This lesson encourages students to think about their reasons to migrate or stay, while also exploring how different people may prioritise different factors. It introduces both internal and

external factors that influence migrants' decision-making when it comes to migrating and how researchers may categorise them in their work.

- **Guiding Question:** What micro-level decision-making influences migration?
- **Terminology**: Economic Migrants, Environmental Migrants, Family Reunion, Political Migrants, Predisposing Factors and Proximate Drivers
- **Reflection Question:** What are some ways a future migrant might try to reduce this uncertainty? What are some barriers to reducing this uncertainty?
- **Maths Exercise:** Developing a formula to calculator 'scores' based on potential migrants' preference ranking

Lesson 3: Macro-Level Drivers

The third lesson asks students to zoom out from the previous lesson on individual decision-making and look at the macro-level processes as they relate to migration. Here, students will delve into the diversity of migration drivers that researchers look at and how they relate to both forced and voluntary migration. The maths exercise will allow students to explore the out-migration of their chosen country experience based on a set of variables.

- **Guiding Question:** What macro-level influences are there to migration?
- **Terminology:** Family Reunion, Forced Migrant, Migration drivers, Voluntary Migration and Regression lines
- **Reflection Question:** Climate Change is likely to influence migration in the future. What macro-level push factors might result from climate change?
- **Maths Exercise:** Collecting data and creating trend lines to analyse effect of crime, GDP and poverty on out-migration

Lesson 4: Natives' Perception of Migrants

This lesson shifts the focus to evidence-informed policymaking while examining natives' perceptions of migrants both at the EU and country levels. Here, students will be encouraged to evaluate their beliefs around immigration and examine survey research. The lesson will also introduce students to some of the current dynamics at play when looking at natives' perceptions including the rise of right-wing extremism.

- **Guiding Question:** How are migrants perceived by the native population?
- **Terminology:** Employment Discrimination, Hanau Shooting, Macroaggression, Microagressions and Radical Right Parties and Movements
- **Reflection Question:** Thinking about the country that you live in, how would you categorise the attitudes of native-borns in your home country and the environment they create in which migrants move into? Are there particular moments or stories that come to mind?
- **Maths Exercise:** Analysing survey data and developing policy areas based on findings

Lesson 5: Determining Migration Policy

This lesson takes a deeper dive into migration policy with the running case study looking at the economic migration of high-skilled workers. Students will also explore the complexity of migration policy, discussing its various forms and at what level of government they can be implemented. To utilise the knowledge they have gained, students will examine a Communication from the European Commission and provide their policy recommendations.

- **Guiding Question:** How are migrants perceived by the native population?
- **Terminology:** Bilateral Labour Migration Agreements, EU Blue Card Directive, High-Skilled Migration, Labour Migration and Migration Policy
- **Reflection Question:** If you were considering moving to another country for a job, what questions would you have? What red flags would make you think twice about moving there?
- **Maths Exercise:** Evaluating recent communication from the European Comission on attracting skills and talent through the lens of their country's worker shortages and surpluses

3.7 Modular Structure

The teaching materials are modular, meaning that teachers can use them in many different ways depending on the needs of their class. Each lesson is stand alone and can be taught on its own or in a group with other lessons. Here are some of the lesson sets we would recommend:

The Maths Story: Lesson 1 - 5

Going through all five lessons not only provides students with a strong base knowledge of migration research, but it also allows students to go through the process of migration research through the story told by the maths exercises. This story parallels the work that researchers do from understanding the subject to developing policy recommendations. Lesson 1 begins the journey by having the students gain a familiarity with the country and the trends within it. Lesson 2 allows students to create their own variables in the context of micro-level decision making. Lesson 3 examines trend lines through linear regressions. Lesson 4 analyses research results to determine the policy agenda. Lastly, Lesson 5 looks at the case study of attracting skills and talent to present policy recommendations.

Push & Pull: Lessons 1-3

Through the first three lessons, students learn a strong basis of the push and pull dynamics that are at play. While Lesson 1 introduces migration and migration uncertainty, lessons 2 and 3 discuss the pull and push factors at work at the micro and macro levels respectively. From shock events to the housing market in their destination countries, students will dive into the complexity that is the decision to migrate.

Migration Policy: Lesson 1, 4 & 5

If you instead want to focus on the policy aspect of the lessons, for example for social science or government classes, these three lessons will do the trick. The first lesson is an introduction to the topic of migration and allows students to get familiar with their country. Lesson 4 introduces important public policy terminology and shows how data can be used to determine policy saliency. Lesson 5 brings the students to the policy recommendation stage while looking at attracting skills and talent to their country.■