STEPS FOR CREATING INDIVIDUALIZED TASKS ON TOLEDO

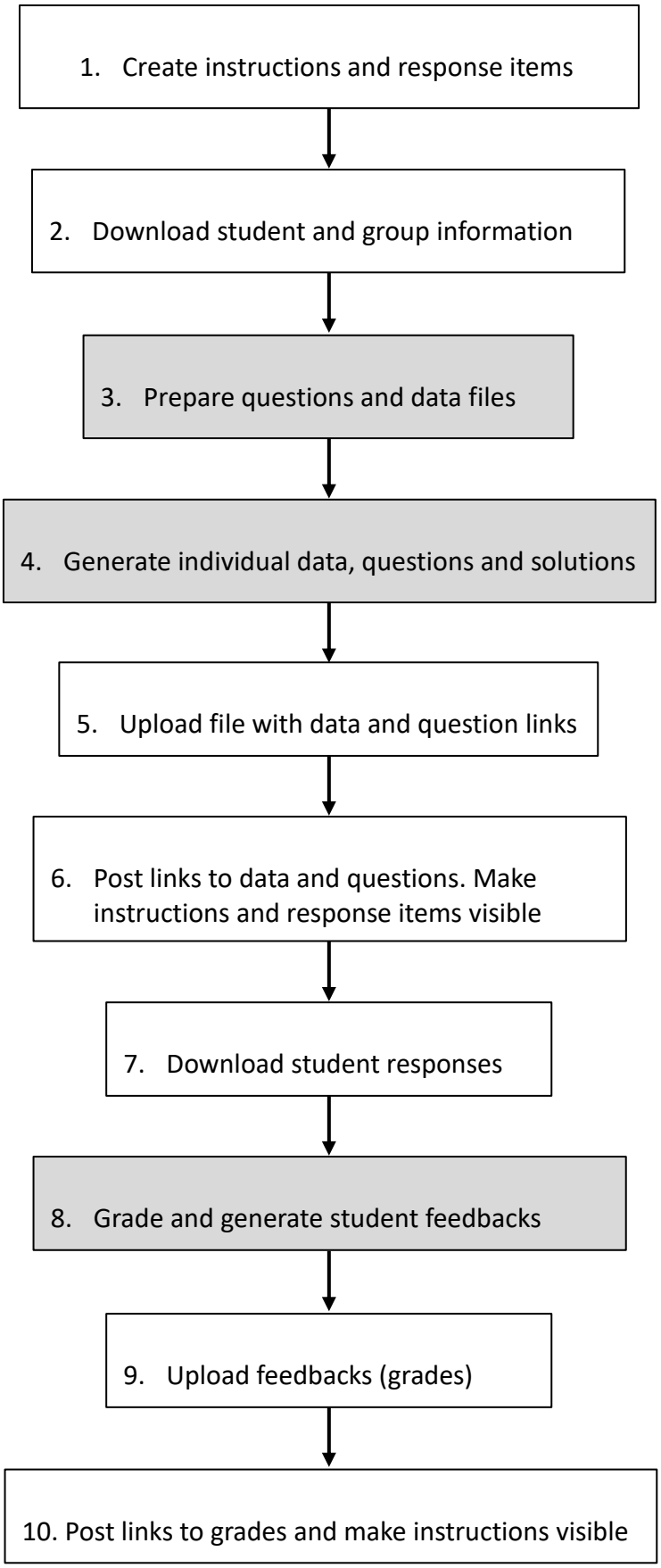

Figure 1 Main steps in creating individualized tasks on Toledo

Figure 1 shows the main steps for creating individualized tasks on Toledo. Some steps are implemented on Toledo while others are implemented outside of Toledo (shaded on the figure).

The next sections provide more details on each of these steps.

1. CREATE INSTRUCTIONS AND RESPONSE ITEMS ON TOLEDO

Every task has two items on Toledo: Instructions and response items. A description and the steps for creating these items are summarized below.

1.1. TASK Instructions

Provides instructions related to the task such as links to the data, questions and feedbacks (after responses have been graded) for each student. The links are provided as part of the Feedback for participants. Two links are initially provided with instructions for accessing data & questions. An additional link is later provided with feedbacks containing grades after grading students' responses.

To create an Instructions item for a TASK;

- Go to the course page on Toledo -> **Gradebook** -> Hold the curser pointer against one of the horizontal lines. A plus sign (**+**) shows up -> Click on the plus sign -> Click the *Add Item* option -> Provide the name -> Click Save

Tips:

- Instruction items should be created via Gradebook not via content. This is so that when they are downloaded, they contain user information and feedback columns to be populated with links for data/questions/feedbacks.
- Ensure the links in the feedback columns do not contain spaces when uploading back.

1.2. TASK Responses

Provides a platform on which students enter their responses to questions using the data provided.

To create a Responses item for a TASK;

- Go to the course page on Toledo -> **Content** -> Under Organization Content, Click on the relevant section (PART #) -> Hold the curser pointer against one of the horizontal lines. A plus sign (**+**) shows up -> Click on the plus sign -> Click the *Create* option -> Click on *Test* under the Assessment section -> Provide the name of the test. Under the test settings, specify the Due date and the number of attempts allowed. You can also specify the time limit under the *Marking* option in the test settings -> Click on the plus sign (**+**) under *Content and Settings* -> Click on *Add Calculated Numeric question* -> Write the question text -> Click Save.

Tips:

- More questions can be added after saving preceding questions by the same procedure:
    - Click on the plus sign (**+**) under *Content and Settings* -> Click on *Add Calculated Numeric question* -> Write the question text and specify the points -> Click Save
- Responses items should be created via Content and not via Gradebook. This is so that the item contains the C*ontent and Settings* tab below which responses to the questions can be collected from students. Students' responses can then be downloaded for grading as described in section 7.

2. DOWNLOAD STUDENT AND GROUP INFORMATION

2.1. Student information data

Contains names, usernames and columns for providing feedback for all students enrolled in a course.

To download this data;

- Go to the course page on Toledo -> Gradebook -> Click on Download Gradebook icon to the right of the page -> Select the instruction item to download e.g. TASK#-instructions -> Check the *Include feedback for the selected item option ->* Choose the excel format (csv) -> click on download
- Locate the downloaded file on the computer, rename it to ***olduser_info_TASK#.csv*** and save it in the **FILES** folder for the respective task#.

2.2. Group information data

Contains group information for the students (if this information is available).

To download this data;

- Go to the course page on Toledo -> Click on the *Settings & Info* tab (the three horizontal lines at the top right corner) -> Under Settings, click on *Import/export users and groups* -> Click on the *download* button under Groups.
- Locate the downloaded file on the computer, rename it to ***group info_TASK#.csv*** and save it in the **FILES** folder for the respective task#.

3. PREPARE QUESTIONS AND DATA FILES (Outside Toledo)

3.1. Data file

Prepare a data file on which the task is based if it is available. The data can also be simulated.

3.2. Questions file

Prepare a pool of questions on which the task is based. Locate the file on the computer, rename it to **vragen_questions_taak#.xlsx** or **vragen_questions_taak#_story_$.xlsx** where applicable and save it in the **FILES** folder for the task**.** The # in the questions file name refers to the task number. The $ - when applicable - refers to the story number.

The questions file has a set of questions (Vraag ID column) that are grouped into blocks (BLOK column). Each block tests a specific skill in the task. A question is randomly selected from each block for each student. If the number of blocks is more than the number of questions planned, a few blocks can be preselected depending on the desired skills to be tested.

Every question is in Dutch and has its English translation (Vraag and Question columns) for the two language groups in the class. Thus every student gets an individualized task in their desired language.

4. GENERATE INDIVIDUAL DATA, QUESTIONS AND SOLUTIONS (Outside Toledo, using R)

Procedures for generating individual datafiles, questions and solutions are implemented in R scripts. These scripts can be found in the **0.SCRIPTS** in each task's main folder. Brief descriptions of these R scripts are provided below.

4.1. 0_source_taak#.R (# refers to the task number: 0_source_taak0.R for Task 0, 0_source_taak1.R for Task 1 etc.)

This contains functions that are needed in other scripts. The available functions are:

a. **getDATA** : reads data from a folder containing data for each individual
b. **getSOL:** fits models and outputs solutions for every question in the respective task
c. **comp:** compares the answers from students with the solutions from **getSOL()**
d. **gradingTOOL:** provides a grade for each question. The grade is 1 if the answer by the student matches the correct solution, else the grade is 0.

4.2. 1_geneer individuele codes en datasets.R

The first R script to be run. It creates random codes and datasets for each individual. It requires student information, group information data and datafiles described in Sections 2 and 3 2 to run.

Tips:

- For time series tasks, the randomly selected datasets should include a complete series per unique identifier.
- Copies of the individual datafiles generated are saved on the public folder **W:drive** (*W:\\TASK#\\1.DATA*) and on **OneDrive-KU Leuven** (*2.INDIVIDUAL\\1.DATA* folder of the working directory for *TASK#*). The latter is faster when accessing the saved data for generating solutions in Section 4.3 compared to the W:drive.

4.3. 2_genereer_test_vragen_en_antwoorden.R

The second R script to be run. It randomly assigns questions (from the pool of questions) and generates solutions to each question for each student. It is dependent on the 0_source_taak#.R and 1_genereer individuele codes en datasets.R files.

Tips:

- Copies of the individual questions generated are saved on both the **W:drive** (*W:\\TASK#\\2.QUESTIONS*) and on **OneDrive-KU Leuven** (*2.INDIVIDUAL\\2.QUESTIONS* folder of the working directory for *TASK#*).
- A file with solutions and questions each for all students is saved in the FILES folder of the respective task#.
- In general, you can adapt the R scripts by setting your folders (both on W:drive and on local machine) to correspond to the ones used here. Then you only need to change the PersonID variable (i.e. your u-number) in the individual R files.
- The questions should be adapted for each task.

5. UPLOAD FILE WITH DATA AND QUESTIONS LINKS TO TOLEDO

Links to individual datasets and questions are uploaded to Toledo after populating the "Feedback to Learner" column in the student Information datafile (i.e., ***olduser_info_TASK#.csv).*** To populate the "Feedback to Learner" column, run the fourth R script - ***CHECKUPLOAD.R*** found in **0.SCRIPTS** folder.

5.1. CHECKUPLOAD.R

Requires the **olduser_info_TASK#.csv** and the paths to the public folder for data, questions and feedbacks. Since you only intend to provide links to data and questions at this point, comment out the link to feedbacks.

After running this script, a file – **CHECKUPLOADFILE_TASK#.csv** – is saved in the FILES folder in the corresponding task#. This file is uploaded on Toledo as follows:

- Go to the course page on Toledo -> Gradebook -> Click on Upload Gradebook icon to the right of the page -> Select the file to be uploaded e.g. CHECKUPLOADFILE_TASK#.csv -> click on Upload.

6. POST LINKS TO DATA AND QUESTIONS AS FEEDBACK AND MAKE THE INSTRUCTIONS AND RESPONSE ITEMS VISIBLE

To post the links to individual data and questions for all students, click on the Instructions item under a task, locate the "Post all marks" button and click on it.

To make the links to individual data and questions visible for everyone, click on the Instructions item under a task and choose "Visible to participants" button available at the top right hand corner of the page that pops up.

The responses item only needs to be made visible to participants. The procedure is similar to that for the instructions item.

Tips:

- You can post the links for individual students separately by clicking on the *Post button* under the *Post column* for the student. In this case, only students whose instructions have been posted will see the Instructions when they are made visible.
- Instructions can be posted ahead of time and made visible to participants at the due time.

7. DOWNLOAD STUDENT RESPONSES

At the end of the task, responses from students are downloaded for grading outside of Toledo.

To download responses;

- Go to the course page on Toledo -> Gradebook -> Under Markable Items, click on the three dots (**…**) on the relevant responses item (TASK#-Your responses) to the right of the page -> Select Download Results -> Choose the File Type/excel format (xls) -> Check *By question and participant* option under Format of Results -> click on Download
- Locate the downloaded file on the computer, rename it to ***responses_test_TAAK#.xlsx*** and save it in the **FILES** folder for the respective task#.

8. GRADE AND GENERATE INDIVIDUAL FEEDBACK FILES (Outside Toledo, using R scripts)

To grade students' responses, run the *3_correct_HI_taak.R* script available in **0.SCRIPTS** folder.

8.1. 3_correct_HI_taak#.R

Creates the feedback files for each individual student using the **gradingTOOL()** function from **0_source_taak#.R**. It requires:

1.1.1 **Responses data**: downloaded in Step 7.
1.1.2 **Solutions file:** generated in section 4.3 of Step 4.
1.1.3 **User info with coding file:** from section 4.2 of Step 4.

- Copies of the individual feedbacks generated are saved on both the **W:drive** (*W:\\TASK#\\3.FEEDBACK*) and on **OneDrive-KU Leuven** (*2.INDIVIDUAL\\3.FEEDBACK* folder of the working directory for *TASK#*). A file with student details, questions assigned, responses, solutions and grades for all students is saved in the FILES folder of the respective task# as *overallgrades_all_taak#.xlsx.*

9. UPLOAD FILE WITH FEEDBACKS (GRADES) LINKS ON TOLEDO

An extra link to individual grades is added to the "Feedback to Learner" column in the student information datafile (i.e., ***olduser_info_TASK#.csv)*** and re-uploaded to Toledo**.** To re-populate the "Feedback to Learner" column, re-run the ***CHECKUPLOAD.R*** script found in **0.SCRIPTS** folder.

9.1. CHECKUPLOAD.R

Re-run this script after uncommenting the link to feedbacks to add a link to the individual grades to the Feedback column in the **olduser_info_TASK#.csv** file and the paths to the public folder for the feedbacks (W:drive).

After running this script for a second time, a file – **CHECKUPLOADFILE_TASK#.csv** – is saved in the FILES folder in the corresponding task#. This file is uploaded on Toledo as follows:

- Go to the course page on Toledo -> Gradebook -> Click on Upload Gradebook icon to the right of the page -> Select the file to be uploaded e.g. CHECKUPLOADFILE_TASK#.csv -> click on Upload.

Tips:

- Links to the individual data, questions and grades can be implemented separately. However, it may be convenient to minimize the number of items created per task so that it is less confusing to students.

10. POST LINKS TO GRADES AS FEEDBACK AND MAKE THE INSTRUCTIONS ITEM VISIBLE

To post the links to individual feedbacks/grades for all students, click on the Instructions item under a task, locate the "Post all marks" button and click on it.

To make the links to individual feedbacks/grades visible for everyone, click on the Instructions item under a task and choose "Visible to participants" button available at the top right hand corner of the page that pops up.