Automation of NUBC reports

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## Introduction:

This documentation will explain the project setup and the packages used in the automation process. Packages from CRAN and a custom script file, ‘plotmaker.R’, were used. This document also discusses the setup needed to knit the RMarkdown file. The following packages were used:

* *knitr*
* *ggplot2*
* *ggthemes*
* *ggpubr*
* *tidyverse*
* *extrafont*
* *pander*
* *haven*
* *flextable*

Some of these packages are already a part of the R libraries on your computer but re-downloading them will ensure that they are updated to their latest versions. To re-download them, run ***install.packages****(*“packageName”*)* on the RStudio terminal.

## Setting up the project:

#### Step 1:

Open RStudio and click on **File**. Then click on **New Project…**Graphical user interface, text, application

Description automatically generated

#### Step 2:

After step 1, this window should pop-up. Graphical user interface, text, application

Description automatically generated

Select **Version Control** and select **Git**. Graphical user interface, text, application

Description automatically generated

You will now need to enter the Github repository URL for the project (paste this link: <https://github.com/dakshinkarthik/plotmaker>)

Once done, it will automatically pick the repository’s name as your local folder’s name. You can change this name, but it is better left unchanged. You will also have the option of setting a path for the project. Graphical user interface, text, application, email

Description automatically generated

Select **Create Project** and clone the repository on your computer. Once the setup is complete you should be able to see the repository directory on the bottom left portion of the screen. A screenshot of a computer

Description automatically generated

## RMarkdown file setup:

A markdown file is already been created for use, names **function\_test.Rmd**. You can use the same file or create a new **.Rmd** file. If you use a new **.Rmd** file, then the following setup code needs to be put on the new file. Text

Description automatically generated

The code within the ``` ``` is called a code chunk; this is the setup chunk needed. This can be found in **function\_test.Rmd**.

Text

Description automatically generated with medium confidence

This is part of the code goes on top. The title can be changed here or in the generated word document. Formatting of the document can be referenced with another **.docx** file, which is done here with the *reference\_docx* parameter. **ref\_doc.docx**  is in the repository, hence also present in the your cloned repository. All data reads/calls are relative and none of them need to be modified.

### Using **main.graph(qval, new.dat):**

Like the setup code chunk, new code chunk(s) is/are essential for using functions from ‘**plotmaker.R’**.



Notice that the parameter *fig.height* has been used here. This can be used to set custom figure heights for the code chunk’s output. (NOTE: Multiple calls to ***main.graph****(qval, new.dat)* can be done in the same code chunk, but this would generate all graphs with the same height. For taller graphs size 75 is used and size 60 is used for smaller graphs.)

Once all your code chunks are ready, you can knit the markdown file by either clicking on **Knit** or by using the shortcut `Ctrl + Shift + K` (or `Cmd + Shift + K` if you are on MacOS). A screenshot of a computer

Description automatically generated with medium confidence

The resulting file will be named as **function\_test.docx** or whatever the name of your Markdown file is.

## Contents of `plotmaker.R` :

* ***main.graph****(qval, new.dat)* – main function that is responsible for outputting a graph and table by making further calls to other appropriate functions. ***qval***and ***new.dat*** are the only parameters for all the graph and table functions, where ***qval*** accepts the qID of a question and ***new.dat*** accepts the dataset from the RMarkdown file which holds the survey data.

Please use ***main.graph****(qval, new.dat)* for making both tables and graphs. ***main.graph****(qval, new.dat)* generates both the table and graph for the specified *qval* (qID) at the same time.

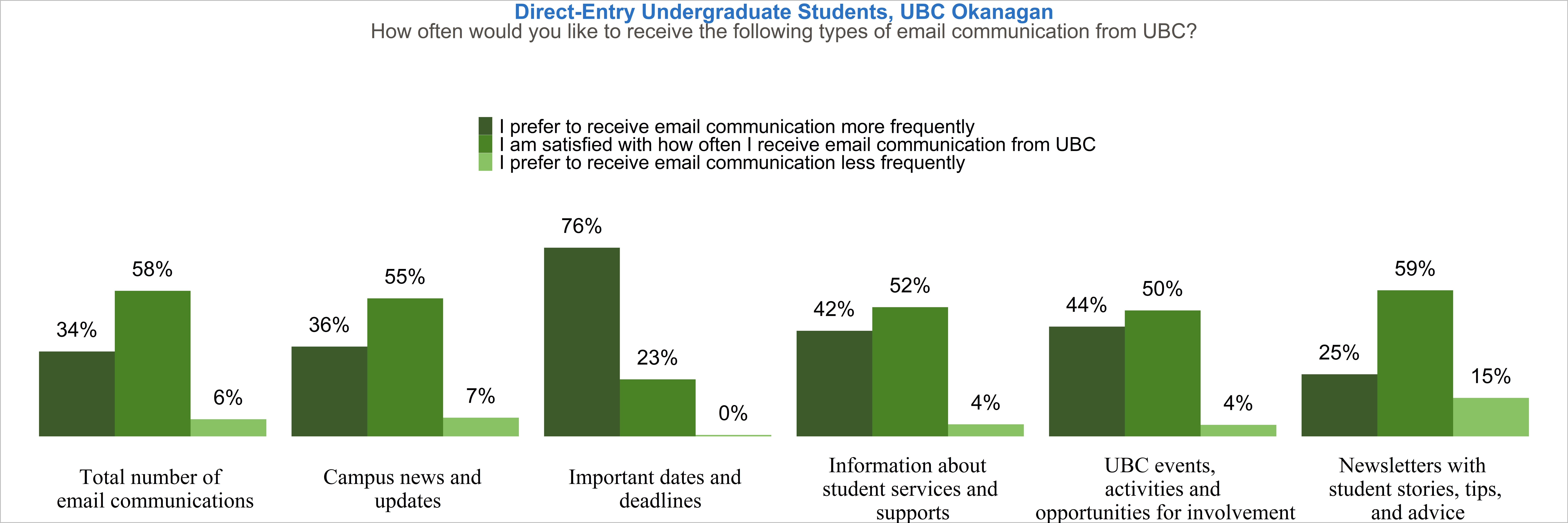
#### Graph functions:

* ***mx****(qval, new.dat) –* function that creates a group of stacked bar graphs of their responses for questions grouped by their qID and of type ‘mx’. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors.

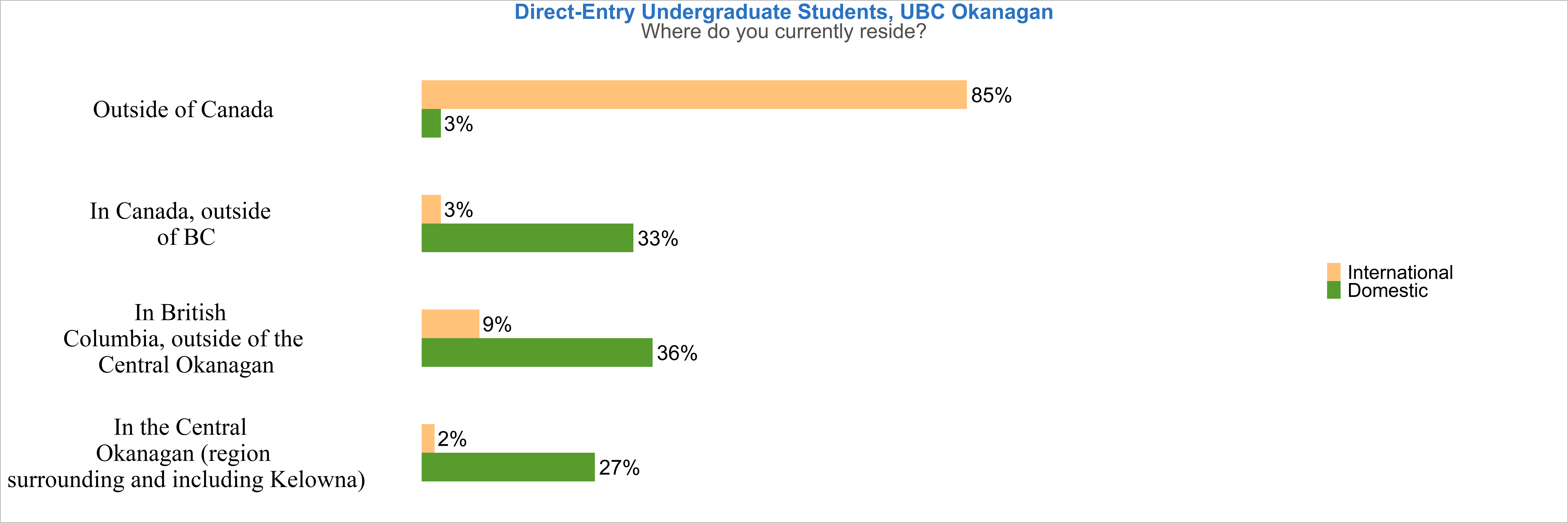
Chart, bar chart

Description automatically generated

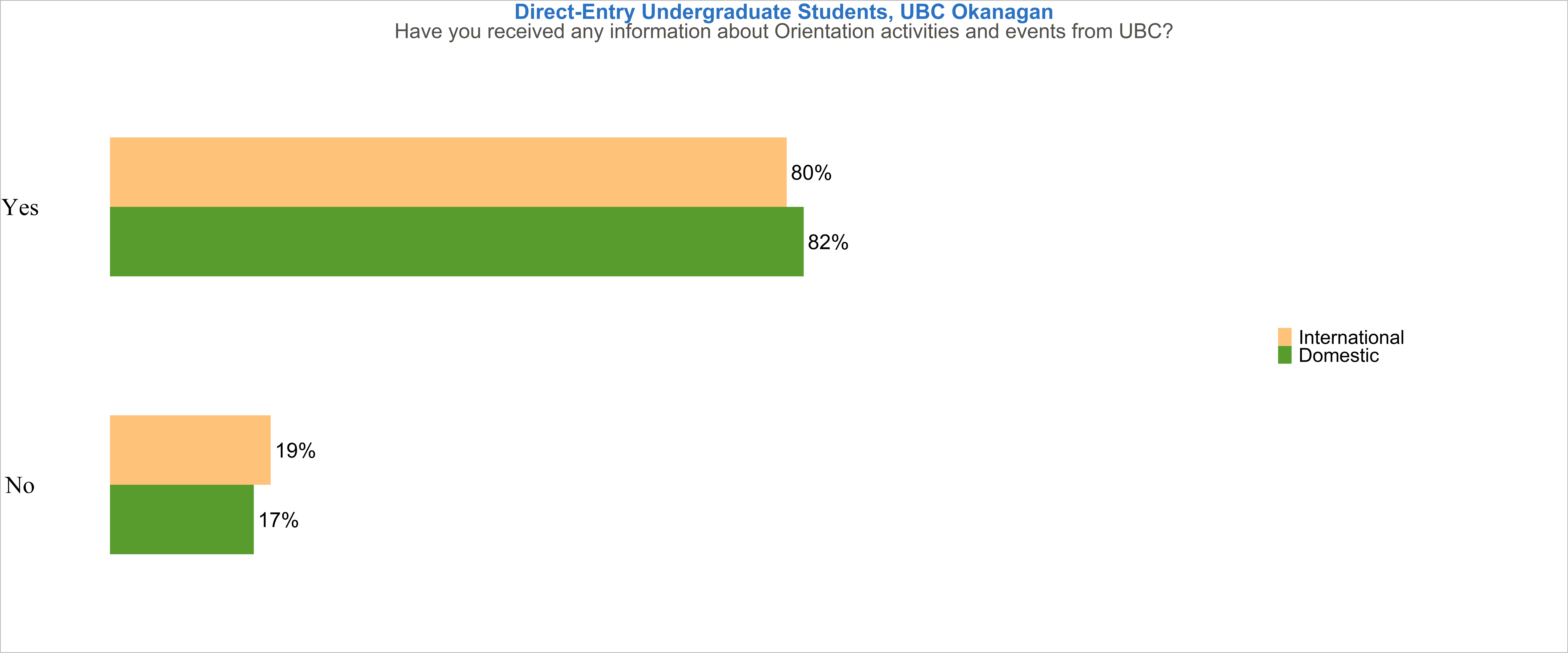
* ***mx.tri****(qval, new.dat)* – function that creates bar graphs in groups of 3, each bar for a response level for each question, for questions grouped by their qID and of type ‘mx’, and differs from ***mx****(qval, new.dat)* in graph-type. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors. (NOTE: only qID that is supported by this function is “commFreq”; use ***main.graph****(qval, new.dat) to avoid this issue.)*



* ***mc****(qval, new.dat)* – function that creates a bar graph for a singular question, with each bar for each response option for the questions of type ‘mc’. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors.



* ***mc.yn****(qval, new.dat)* – function that makes a call to ­***mc****(qval, new.dat)* for ‘mc’ questions with ‘Yes/No’ responses; serves as better compartmentalization of code. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors.



* ***rk****(qval, new.dat)* – function that makes a grouped bar graph of the numerical rating response for the questions grouped by qID and of type ‘rk’. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors.
* ***ms****(qval, new.dat)* – function that makes a bar graph for the questions of type ‘ms’; similar to ***mc****(qval, new.dat)* but deals with distinct count of responses. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors.
* ***cs****(qval, new.dat)* – function that makes a grouped bar graph of the average percent scores of responses for the questions grouped by qID and of type ‘cs’. Can be called directly, but advised to use ***main.graph****(qval,new.dat)* to avoid errors.

#### Table functions:

* ***tb\_mx****(qval, new.dat)* – function that makes tables for questions grouped by their qID and of type ‘mx’. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately.

| **UBCO** | **Don't know** | **Strongly agree/ Agree** | **Including somewhat agree** | **Strongly agree** | **Agree** | **Somewhat agree** | **Somewhat disagree** | **Disagree** | **Strongly disagree** | **Total** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| I am aware of the resources available to help me be successful at UBC | 1% | 54% | 86% | 16% | 38% | 31% | 8% | 3% | 0% | 1250 |
| I know what to do to prepare for my classes in September | 1% | 30% | 69% | 8% | 22% | 39% | 17% | 8% | 2% | 1248 |
| I understand UBC's expectations of academic | 1% | 63% | 88% | 21% | 42% | 24% | 7% | 2% | 0% | 1247 |

* ***tb\_mx.tri****(qval, new.dat)* – function that makes tables for questions with triple-level responses, grouped by their qID and of type ‘mx’. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately. (NOTE: only qID that is supported by this function is “commFreq”; use ***main.graph****(qval, new.dat) to avoid this issue.)*

| **UBCO** | **I prefer to receive email communication more frequently** | **I am satisfied with how often I receive email communication from UBC** | **I prefer to receive email communication less frequently** | **Total** |
| --- | --- | --- | --- | --- |
| Total number of email communications | 34% | 58% | 6% | 1351 |
| Campus news and updates | 36% | 55% | 7% | 1345 |
| Important dates and deadlines | 76% | 23% | 0% | 1348 |
| Information about student services and supports | 42% | 52% | 4% | 1347 |
| UBC events, activities and opportunities for involvement | 44% | 50% | 4% | 1349 |
| Newsletters with student stories, tips, and advice | 25% | 59% | 15% | 1346 |

* ***tb\_mc****(qval, new.dat)* – function that makes tables for questions grouped by their qID and of type ‘mc’. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately.

| **UBCO** | **Domestic** | | **International** | |
| --- | --- | --- | --- | --- |
| **%** | **n** | **%** | **n** |
| In the Central Okanagan (region surrounding and including Kelowna) | 27% | 347 | 2% | 10 |
| In British Columbia, outside of the Central Okanagan | 36% | 457 | 9% | 39 |
| In Canada, outside of BC | 33% | 417 | 3% | 15 |
| Outside of Canada | 3% | 41 | 85% | 365 |
| Distinct count of respondents | 100% | 1262 | 100% | 429 |

* ***tb\_mc\_yn****(qval, new.dat)* – function that makes tables for questions with “Yes/No” responses, grouped by their qID and of type ‘mc’. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately. (NOTE: only qID that is supported by this function is “commFreq”; use ***main.graph****(qval, new.dat) to avoid this issue.)*
* ***tb\_rk****(qval, new.dat)* – function function that makes tables for questions grouped by their qID and of type ‘rk. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately.
* ***tb\_ms****(qval, new.dat) –* function that makes tables for questions grouped by their qID and of type ‘ms. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately.
* ***tb\_cs****(qval, new,dat)* – function that makes tables for questions grouped by their qID and of type ‘cs’. Automatically called by ***main.graph****(qval,new.dat)­*; can be called separately.