



# Inclusivity and Equity in Testing: Enabling Multilingual Assessments

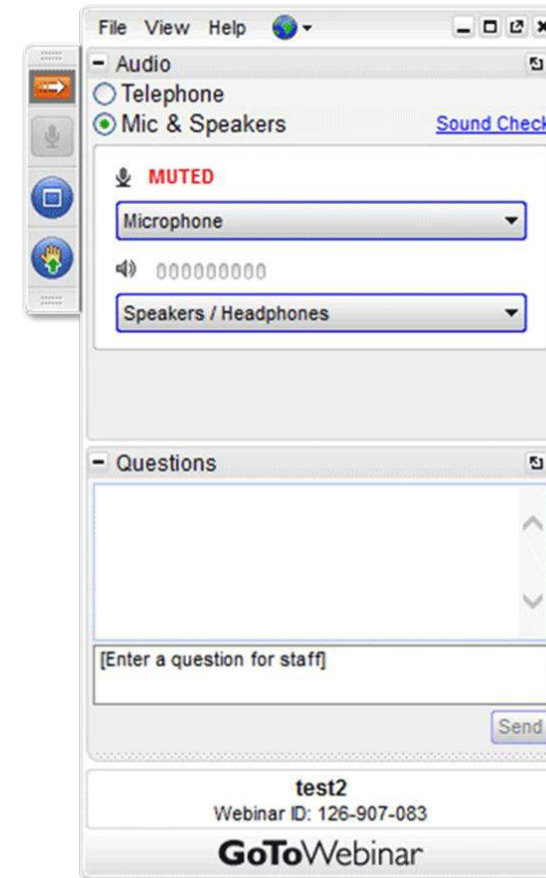
**Gavin Cooney**, CEO, Learnosity & Questionmark

**John Kleeman**, EVP, Learnosity & Questionmark

To ask questions,  
use the “Questions”  
feature

**Watch for an email after the training:**

- Download slides (PDF)
- View a recording





Learnosity CEO, Gavin Cooney

- Co-founded Learnosity in 2007
- Acquired Questionmark in June 2021
- Learnosity Assessment Engine - delivered via modern APIs - powering assessment excellence



Questionmark Founder, John Kleeman

- Founded Questionmark in 1988
- Assessment management system provider
- EVP External Relations and Bus Dev, Learnosity & Questionmark
- 2021 Chairperson of ATP

# Learnosity manifesto



**Education is a human right.** We believe that education and learning opportunities should be equitable, inclusive, and accessible to all. Our mission is to advance education and learning worldwide with best-in-class technology.



**Do the right thing.** Fairness is the bedrock of our business. We're open, honest, and take full responsibility.

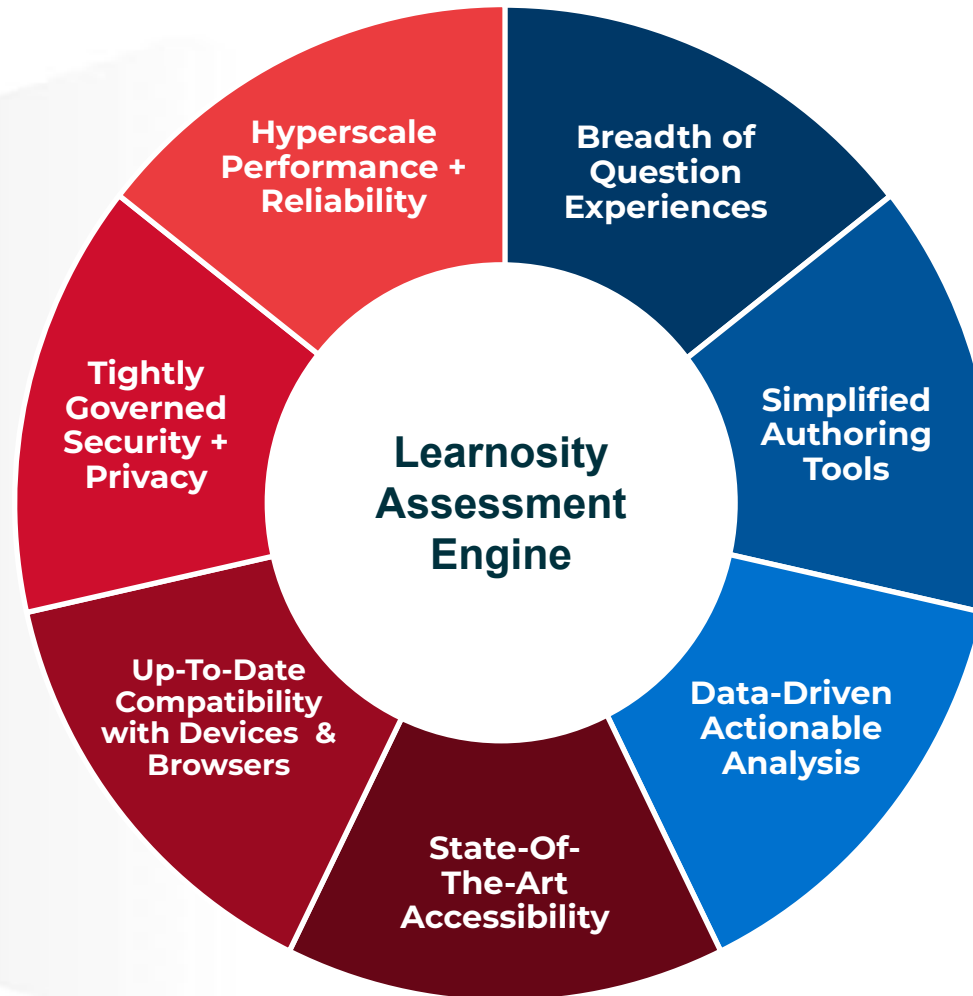


**Aim higher.** We keep raising the bar by not shying away from tackling the biggest challenges.



**Success is best shared.** Great things happen when everyone pulls in the same direction. We win together by working together.

# Learnosity - Assessment Engine delivered via API



**>40M**  
active learners

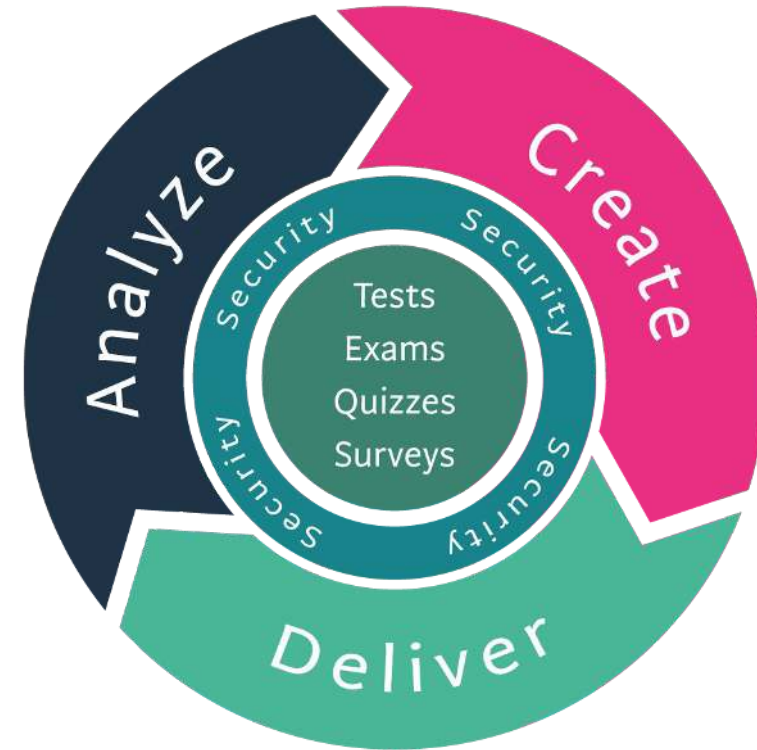
**164M**  
questions authored

**17.32B**  
questions delivered\*

# About Questionmark

## Background

- Founded in 1988
- Assessment solutions to measure knowledge, skills, abilities and attitudes securely for certification, regulatory compliance, workforce learning, sales-force readiness and higher education
- ISO/IEC 27001 Certified (Learn more: [www.questionmark.com/trust](http://www.questionmark.com/trust))



- Questionmark OnDemand
- Questionmark OnDemand for Government
- Questionmark OnPremise

# This session

- **A good test**
  - Does not advantage or disadvantage individuals because of characteristics irrelevant to the construct being measured
- **In this session, we look at**
  - How native language of test takers impacts test fairness
  - Possible technology approaches to improve
  - How Questionmark and Learnosity can help





question  
mark

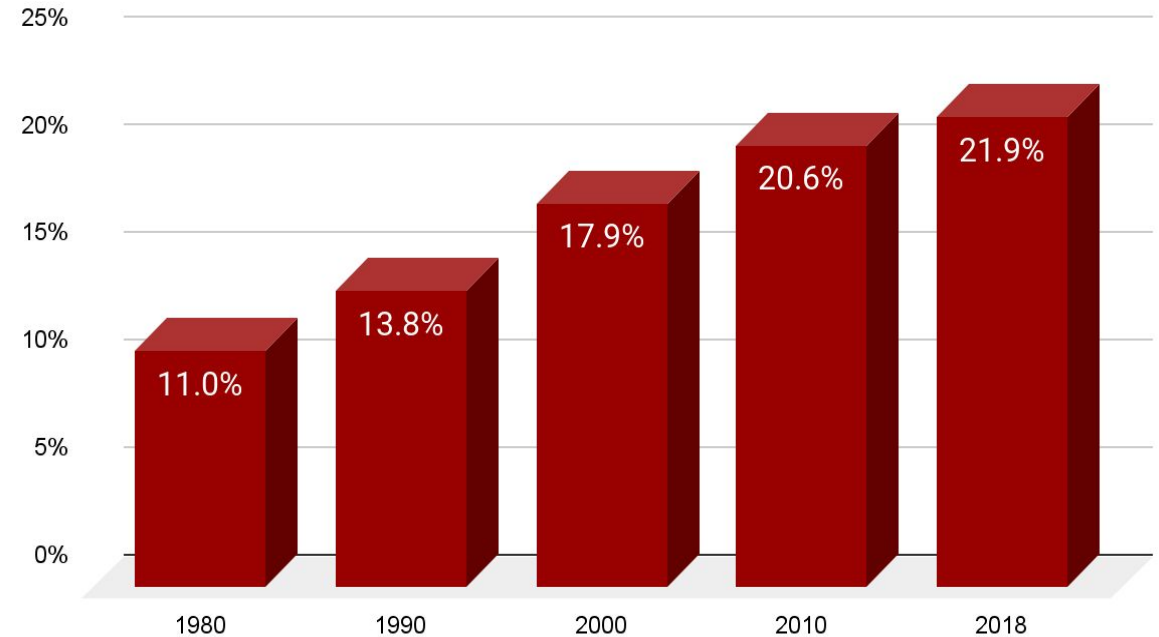
# A macro view of global languages



# US residents who speak a language other than English at home

- **67 million US residents spoke a foreign language at home in 2018**
  - 41 million Spanish
  - > 1 million Arabic, French Chinese, Korean, Tagalog, Vietnamese
- **% has doubled since 1980**

Source: cis.org

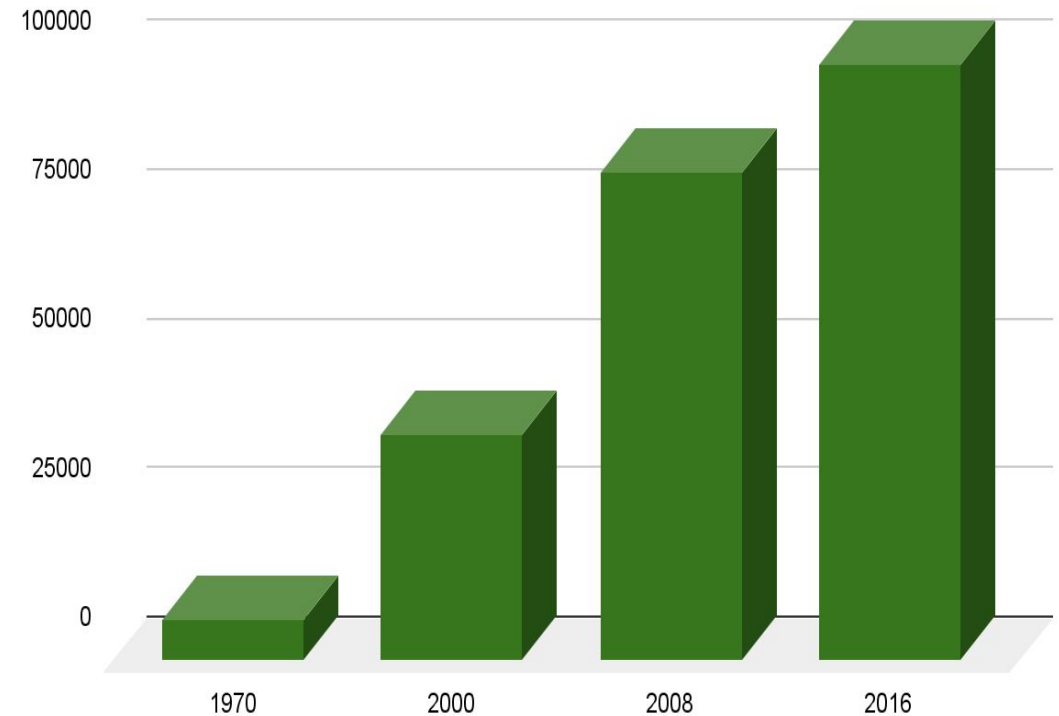


<https://cis.org/Report/673-Million-United-States-Spoke-Foreign-Language-Home-2018>

# Meanwhile companies are becoming more international

- In 1970, ~7,000 multinational companies
- Today > 100,000
- Around half of global trade in 2014 was via multinationals
- Internationalization increased by pandemic

Number of multinational companies. Source: OECD and other estimates

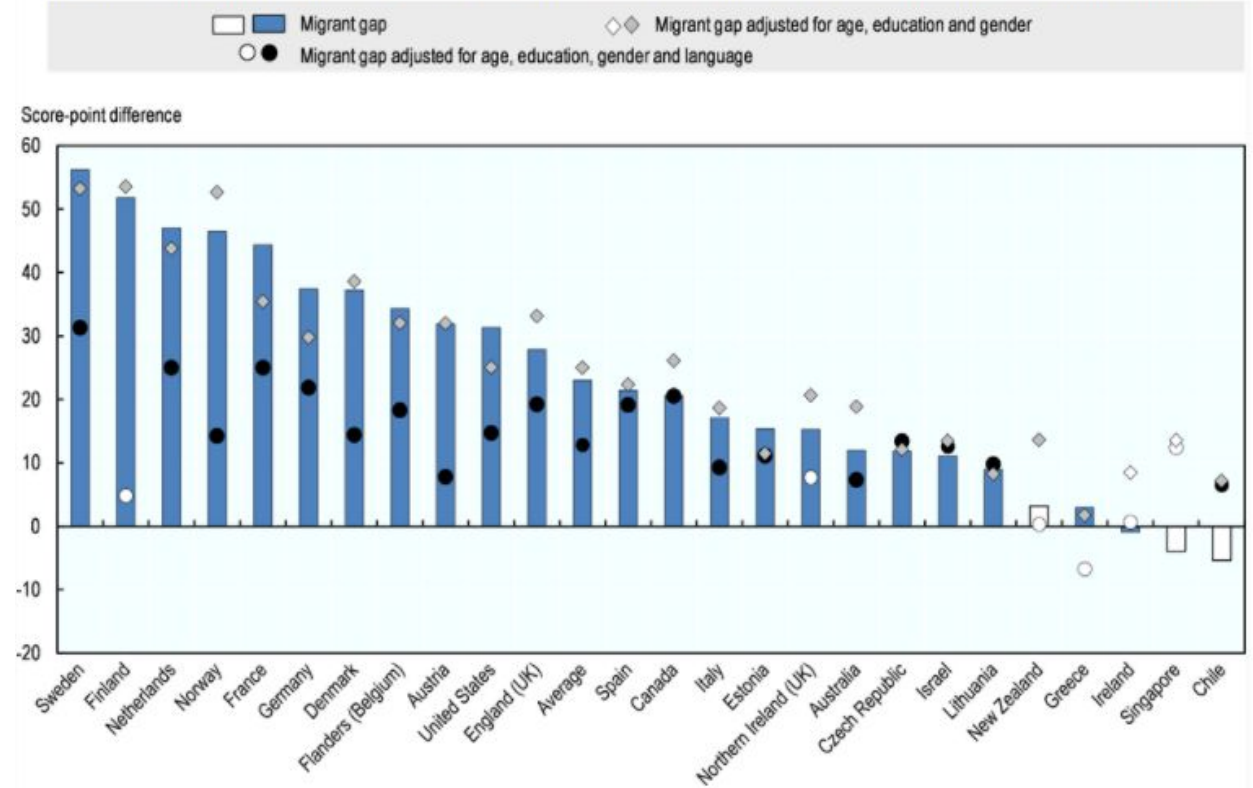


# Evidence that people do less well on tests in non native language

- OECD: ~12% in range of developed countries of adults are non-native speakers
- Migrants get significantly lower literacy & numeracy test scores than native speakers
- ~ half difference relates to language of test (i.e. half of it disappears if tested in own language)
  - Source: OECD Skills on the Move, Migrants in the Survey of Adult Skills (2018)
  - <https://www.oecd.org/migration/skills-on-the-move-9789264307353-en.htm>

Figure 3.5. Gap in numeracy performance between natives and migrants, in PIAAC participating countries

Unadjusted and adjusted differences in numeracy score between migrants and natives (Natives minus migrants)

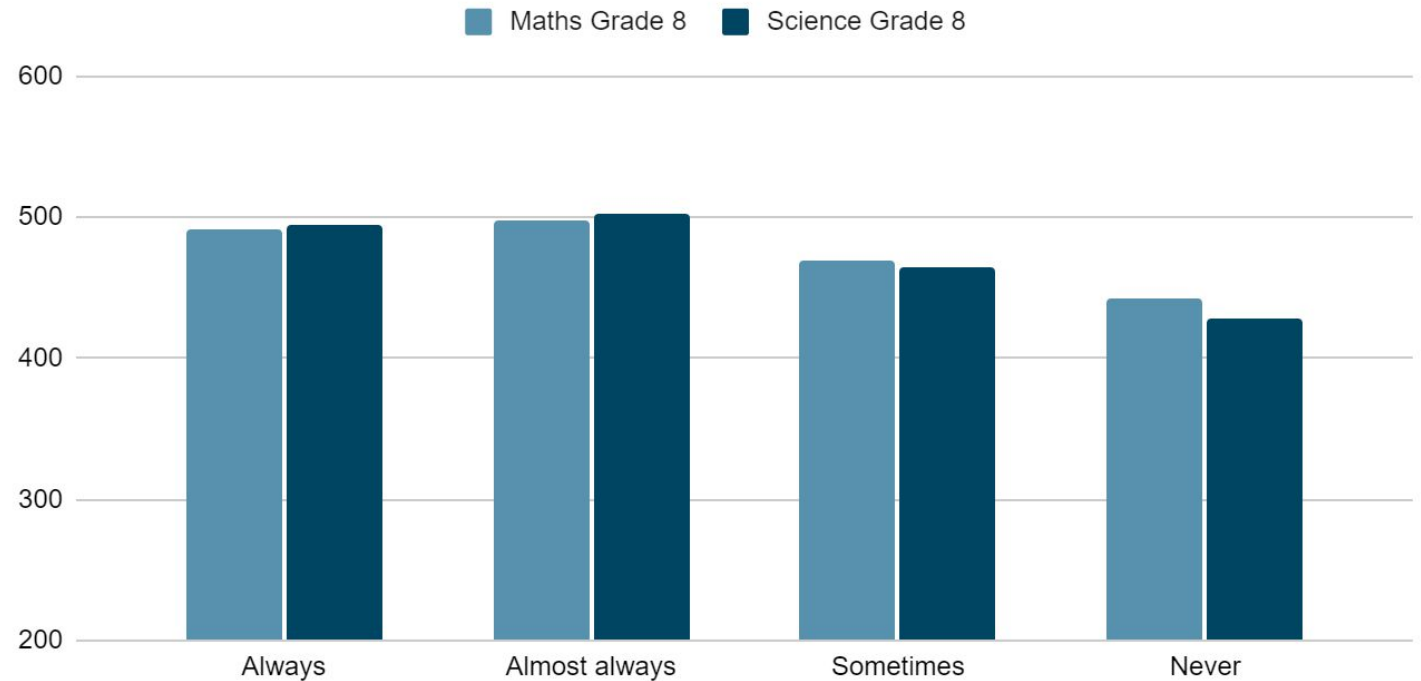


# Do non-native test takers have a disadvantage?

- General consensus that test takers moderately disadvantaged by taking a test in a non-native language
- For example data from international TIMSS maths & science test

○ <https://timss2019.org/reports/students-speaking-the-language-of-the-test/>

TIMSS 2019 average scores: does test taker speak language of test?



# Not just English language

**Nathalie Greenan**  
Conservatoire National des Arts et Métiers, Paris  
**Joseph Lanfranchi**  
Université Paris 2, Panthéon-Assas  
**Yannick L'Horty**  
Université Paris-Est

**Mathieu Narcy**  
Conservatoire National des Arts et Métiers, Paris  
**Guillaume Pierné**  
Université d'Angers

Research Article | Do Competitive Examinations Promote Diversity in Civil Service?

- French study found exams can discriminate against non-French speakers
- Do Competitive Examinations Promote Diversity in Civil Service?  
Greenan et al, Public Administration Review 2019. <https://onlinelibrary.wiley.com/doi/full/10.1111/puar.13053>
  - Looked at 72 exams for >500,000 people
  - People born outside France 8.6% less likely to succeed in exams
  - Exams also discriminated against those outside Paris, from poorer areas and in some cases women
  - Ameliorated by oral interviews



# What can we do about it?

- Write test to use simple language and minimally impact non-native speakers
  - Follow good guidelines
  - Have strong reviewing and piloting
- Provide tests in multiple languages
  - Translate or adapt into multiple languages
  - Provide easy authoring for those in different countries/departments to allow more than just a single central test
- Accommodations for non-native speakers
  - Dictionaries
  - On the fly translation
  - Extra time ...



question  
mark

The technology that supports  
translations

## Technology should:

1. Support authoring of questions in any language / character set
2. Include right-to-left languages
3. Facilities for collaborative reviewing / commenting on items during authoring
4. Support test taker instructions in any language and test taker choice of language
5. Analysis & reporting to take account of language
6. Support translation of assessments



# Right-to-left considerations

- Must conform to test-taker expectations
- Layout must be mirrored, incl.
  - Layout, text and graphics
  - Navigation buttons
  - Icons that communicate direction
  - Text - aligned to the right
  - Excl. numbers & untranslated text
- Important to consider bidirectional content
- Numbers, incl. icons with numbers must be localised  
e.g. Egypt uses (٠,١,٢,٣,٤), Morocco uses (0,1,2,3)



# Mirroring: Layout and text

⏮
25:00 / 00:12
13 من 1

Learnosity عرض التدويل

سؤال 1

سؤال 2

سؤال 3

سؤال 4

سؤال 5

سؤال 6

سؤال 7

سؤال 8

حدد المكان الذي ستجد فيه فوهة البركان.



التالي

⏮

البركان هو جبل به حمم بركانية (صخور ساخنة سائلة) تخرج من قرن الصهارة تحت الأرض أو خرجت منه في الماضي. تتكون البراكين من حركة الصفائح التكتونية. تنقسم القشرة الأرضية إلى 17 لوحة تكتونية صلبة. هذه الألواح تطفو على طبقة أكثر سخونة ونعومة في وشاح الأرض. غالبًا ما توجد البراكين في الأماكن التي تتحرك فيها الصفائح التكتونية أو تتجمع معًا. يمكن أن تتشكل البراكين أيضًا في أماكن حيث يوجد تمدد وترقق ألواح القشرة الأرضية، على سبيل المثال، في صدع شرق إفريقيا. عادة لا توجد براكين حيث تنزلق صفيحتين تكتونيتين على بعضهما البعض.

انفجار البركان الذي يحدث بعيدًا عن حدود الصفائح ناتج عن أعمدة الوشاح. يُعتقد أن هذه "النقاط الساخنة" على سبيل المثال هاواي تنشأ من الصهارة المتصاعدة من حدود اللب الباردة.

العباءة على عمق 3000 كيلومتر تحت الأرض.

تحتوي معظم البراكين على فوهة بركانية في الجزء العلوي. عندما يكون البركان نشطًا، تخرج المواد منه. وتشمل المواد الحمم البركانية والبخار ومركبات الكبريت الغازية والرماد وقطع الصخور المكسورة.

عندما يكون هناك ضغط كافٍ، ينفجر البركان. بعض الانفجارات البركانية تحدث أعلى البراكين في بعض الأحيان، تخرج الصهارة بسرعة وفي بعض الأحيان تخرج ببطء. أحيانًا تخرج بعض الانفجارات من جانب واحد بدلًا من القمة.

تم العثور على البراكين على كواكب أخرى غير الأرض. مثال على ذلك أوليمبوس مونس على المريخ.

## Bi-directional

# Text

## Graphic placement


# Bi-directional text

- Bidirectional text: combination of RTL and left-to-right text in the same string
- Some characters have an implied directional meaning
  - Greater-than sign <
  - Parentheses e.g. "open parentheses" is reversed ')
  - **ניפגש ב09:35 בחוף הים** ("we will meet at 09:35 at the beach")

# Mirroring: icons

Learnosity عرض التدويل  
العربية

اكتب مقالاً عن ما تستمتع بفعله في أوقات فراغك.

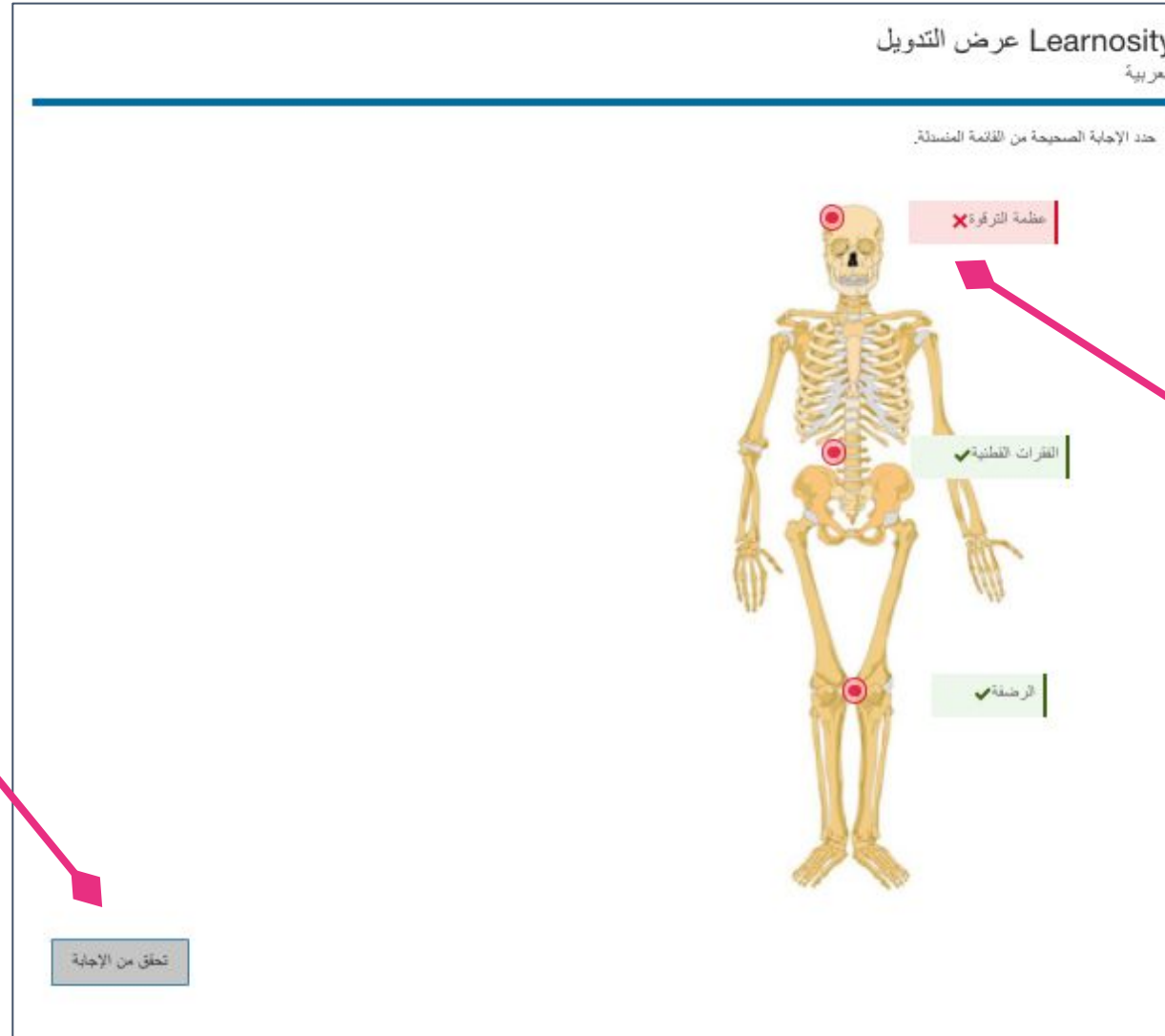
 |   

10000 / 0 حد الكلمة

Icons

# Mirroring: graphics

Submit  
button



Symbol  
placement

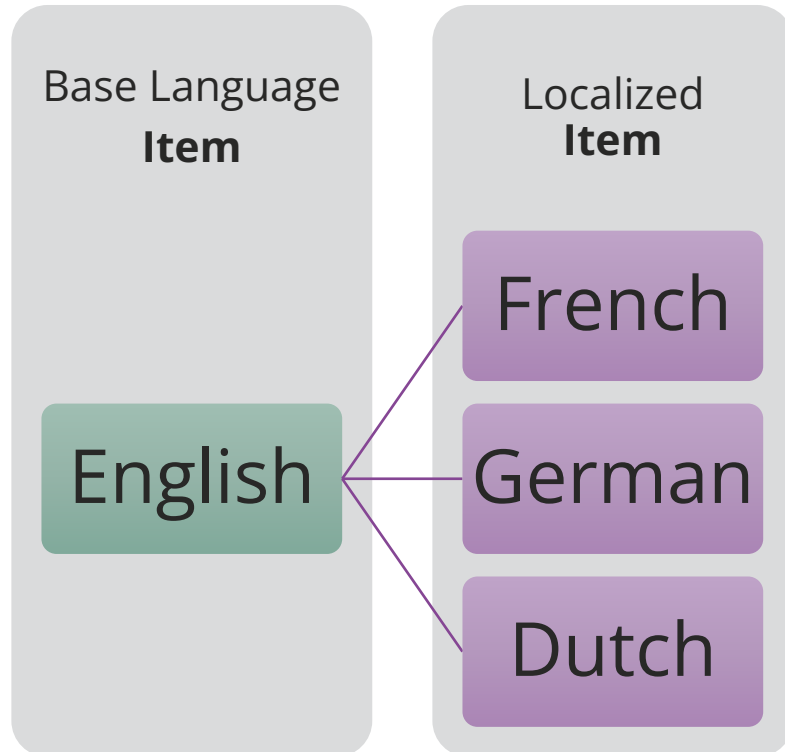


# Questionmark translation management

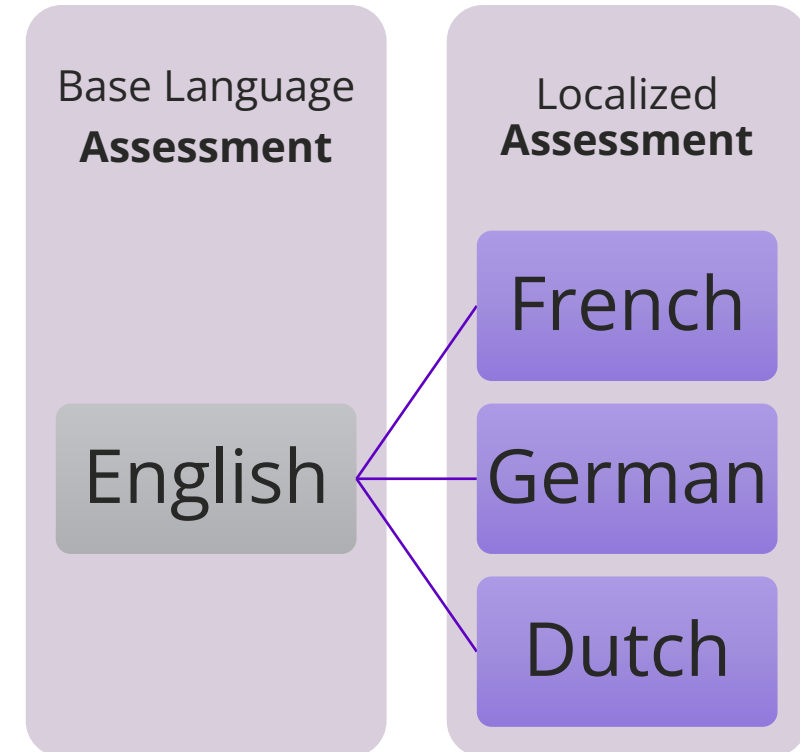
# Topics (& items within) and Assessments

## “Base language” version > “Translated” version

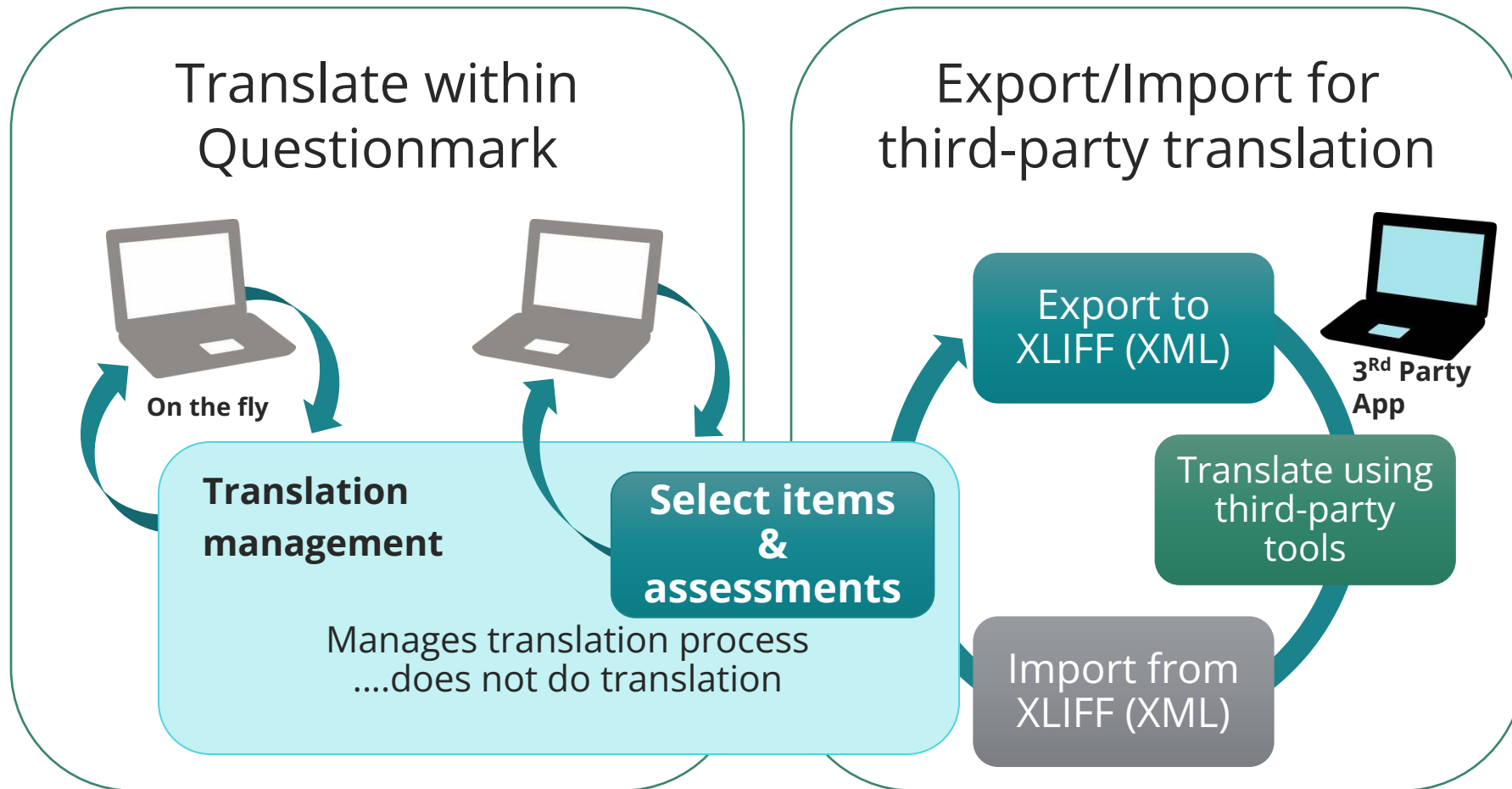
### One item, multiple languages



### One assessment, multiple languages

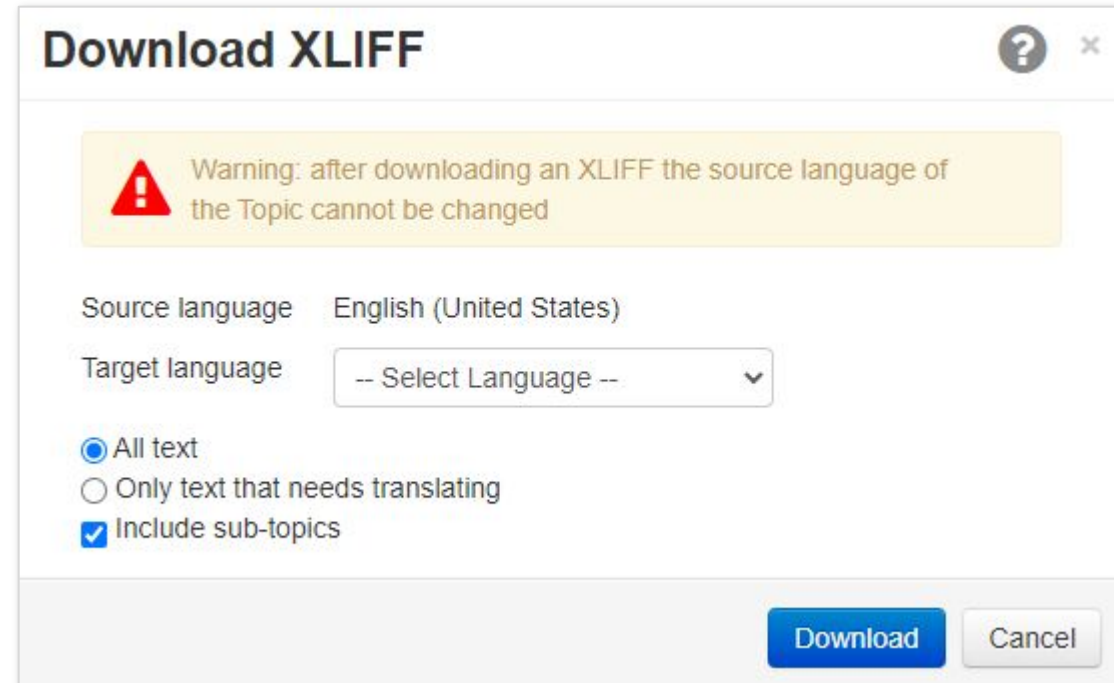
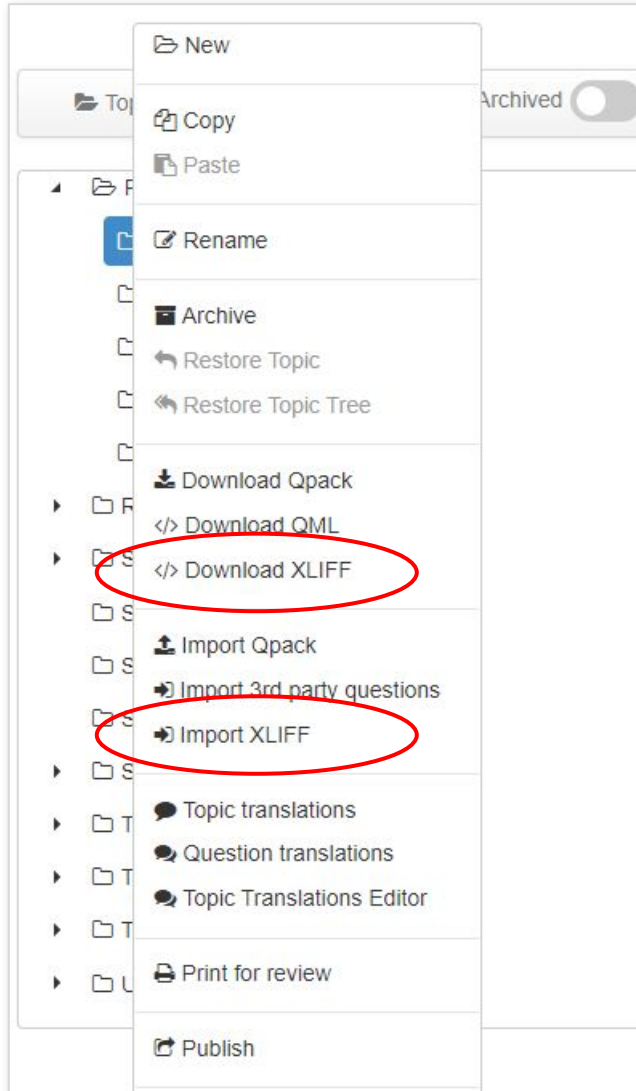


# Managing Multilingual Assessments





# Export XLIFF for Translation



# Track and manage question translations

| Translations   |                  |   |                    |                      |   |
|--|------------------|---|--------------------|----------------------|---|
| <div> <div> <div>&lt;/&gt; Download XLIFF</div> <div>Import XLIFF</div> <div>Topic</div> <div>Edit Translations</div> </div> <div> <div>Archived Questions (0)</div> <div>Translations</div> </div> </div> |                  |   |                    |                      |   |
| Topic  | ID               | Description   | Language           | Translation s...     | Last Modified                               |
| Round the ...  | 666236776806524  | The country of Uganda is located along the equat... | French (France)    | Needs update         | Thu Feb 24 2022 11:13:56 GMT-0500 (Easte... |
| Round the ...  | 666236776806524  | The country of Uganda is located along the equat... | Spanish (Spain,... | Needs update         | Thu Feb 24 2022 12:40:23 GMT-0500 (East...  |
| Round the ...  | 666236776806524  | The country of Uganda is located along the equat... | Dutch (Netherla... | Needs update         | Thu Feb 24 2022 12:43:12 GMT-0500 (East...  |
| Round the ...  | 666236776806524  | The country of Uganda is located along the equat... | German (Germ...    | Needs update         | Thu Feb 24 2022 12:43:38 GMT-0500 (East...  |
| Round the ...  | 7824351131909576 | which country does this flag belong to              | Japanese (Japan)   | Awaiting translation | Thu Mar 10 2022 09:12:54 GMT-0500 (Easte... |
| Round the ...  | 7824351131909576 | which country does this flag belong to              | French (France)    | Translated           | Thu Feb 24 2022 11:13:56 GMT-0500 (Easte... |
| Round the ...  | 7824351131909576 | which country does this flag belong to              | Spanish (Spain,... | Translated           | Thu Feb 24 2022 12:40:23 GMT-0500 (East...  |
| Round the ...  | 7824351131909576 | which country does this flag belong to              | Dutch (Netherla... | Translated           | Thu Feb 24 2022 12:43:12 GMT-0500 (East...  |
| Round the ...  | 7824351131909576 | which country does this flag belong to              | German (Germ...    | Translated           | Thu Feb 24 2022 12:43:38 GMT-0500 (East...  |

# In-app editing of question, assessment translations

Home » Topics » Question Translations

Base Language

English (United States)

Target language

French (France) ▼

Editable fields

Option 4

Option 5

Outcome Condition

Outcome Message 1

Outcome Message 2

Wording

Translation status

Translated ▼

Properties

Save

Exit

◀ Previous Question

Next Question ▶▶

?

Path: Round the world\America\Southernmost city in world

Base

Correct. The southernmost city in the world, Ushuaia, is located in Argentina.

Target

B I U x<sub>2</sub> x<sup>2</sup>

Corriger. La ville la plus méridionale du monde, Ushuaia, est située en Argentine.

# Warning message shown in question editor when translations are pending

[Home](#) » [Topics](#) » Matching

Topic: Multilingual Examples

Translations have been exported for this question, any changes to this question will require re-export of the enclosing topic translations.

Question ID

7461810

Revision ID

8221764

Add New Choice

Edit Unassociated Options

Add comment box

Edit question description

Save

Advanced

Exit

Spell check



B I U x<sub>2</sub> x<sup>2</sup> [list icons]

Match the flag to the country:



Australia



## Publish



### Round the world

Select assessment translation to publish; the base language will always be included.

| Publish                             | Language                                    | Status                               |
|-------------------------------------|---|--------------------------------------|
| <input checked="" type="checkbox"/> | English (United States)                     | Available to publish                 |
| <input type="checkbox"/>            | French (France)                             | Available to publish                 |
| <input type="checkbox"/>            | German (Germany)                            | One or more questions not translated |
| <input type="checkbox"/>            | Spanish (Spain, International Sort)         | Available to publish                 |
| <input checked="" type="checkbox"/> | No additional language (base language only) |                                      |

Only new or updated questions will be published. Select the checkbox below to republish all questions, including those that have been published.

☐ Publish all questions for selected languages

**OK**

Cancel

## Preventing incomplete / in-process translations from being published:

*Assessment language versions with statuses "Awaiting Translation" or "Needs Update" cannot be published*



# Options for calling multilingual assessments via AI CC

Assessment to Publish

Filter assessments

Filter assessments

Clear Filter

Show

10

entries

| Id                       | Name                 | Author         | Last Modified    | Language  | Monitoring Types                     | Test Center |
|--------------------------|----------------------|----------------|------------------|---|--------------------------------------|-------------|
| <input type="checkbox"/> | Round the world      | 400467         | 10-07-2015 10:31 |   | Unmonitored                          |             |
| <input type="checkbox"/> | Round the world quiz | Brian McNamara | 08-16-2021 10:37 | <div>Participant chooses</div> <div>Participant chooses</div> <div>fr-FR</div> <div>en-US</div> | Record and Review Proctoring - Basic |             |

1

Showing 1 to 2 of 2 entries



# Reporting and Analytics

- Standard reports filterable by language
- Editable reports that let you create tables, charts and other visualizations to analyze results by language







# New Instant Translate feature

# Inspired by SAP challenges translating certification exams

## Current state

Today SAP offers certifications for on-premise and cloud products – but human translation cannot be provided in every language for each exam so often exams are translated only in two or three languages.

Due to the rapid release cycles of SAP Cloud products, exams for these are only offered in English.

## Machine translation

SAP is using machine translation successfully to get the learning content translated in up to 8 languages. However, this cannot be used yet for certification exam translations due to quality issues.

Nevertheless, SAP wants to improve the exam experience by offering for non-English native speakers the opportunity to translate content as an additional help kit.



# The innovation: Instant Translate

- SAP and Questionmark are accelerating the delivery of new assessment content with innovative machine translation. Machine translation can aid non-native speakers taking certification and ensure inclusion.

## Guiding principles:



Create a user-friendly way to translate during an assessment



Reduce the amount of time spent on translations for specific questions, or without the need to translate the whole assessment for individuals



Provide on-off option for the translation tool during the assessment as a side offering while taking the original exam in the English language

By applying these guiding principles, SAP and Questionmark have **improved accessibility** for everyone, **saved time and money** for human translation and ultimately **included everyone** to succeed.

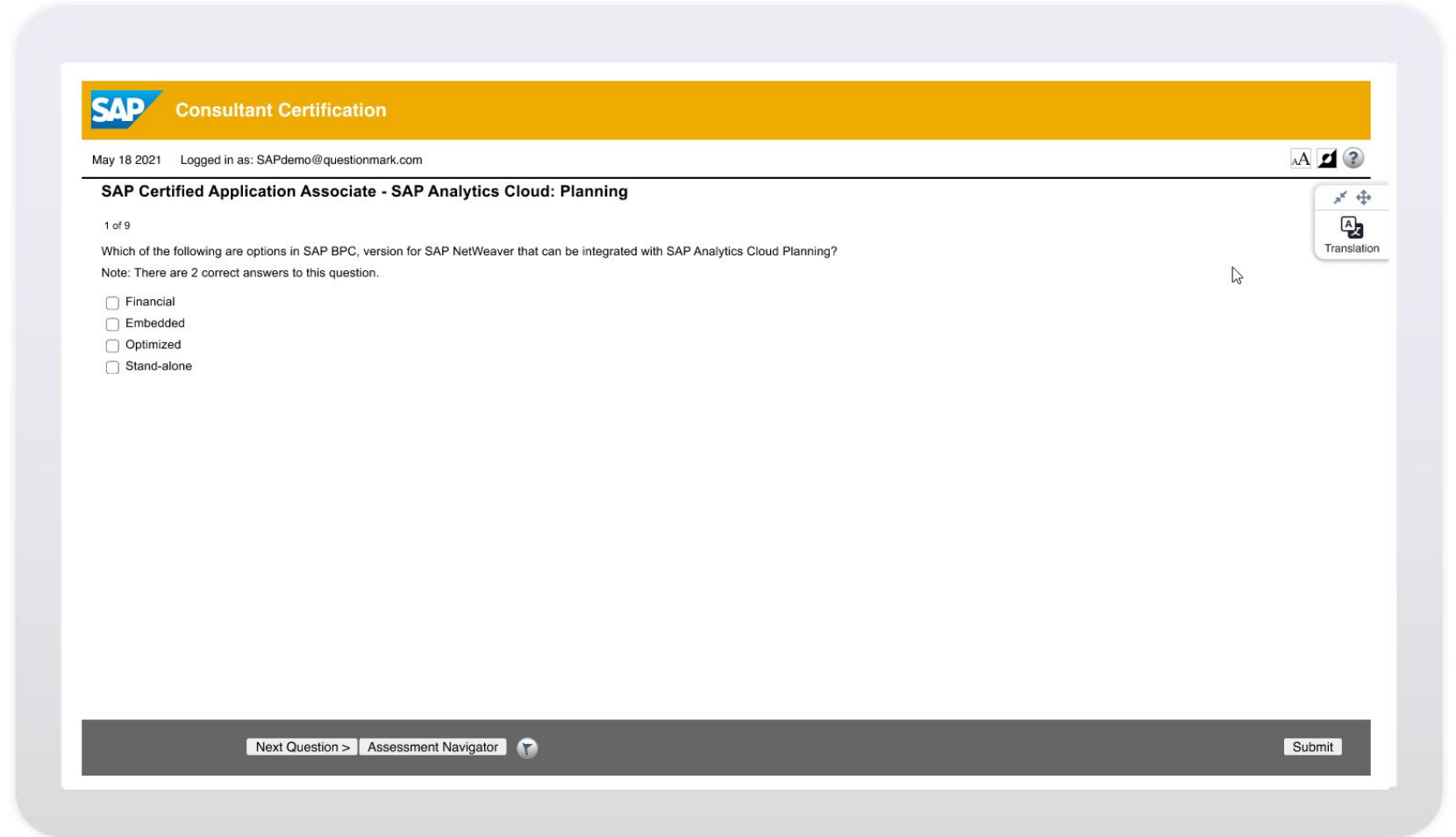
# How it works: human translated exam language selection

- When the assessment is provided in the target language, it was translated in advance and the candidate gets to choose the language of the assessment when they launch.
- But what if the candidate's first language is not represented?
- Machine translation can be used to help provide support in the candidate's first language.



# How it works: Instant Translate

- When the exam begins, the candidate can open the translation tool, choose target language from the provided list and the translation of the text will appear real-time in the tool.
- The user can choose different text on the screen to be translated as full sentences for the most accurate context.
- SAP will provide machine translation from English to other languages including:
  - Chinese
  - French
  - German
  - Japanese
  - Korean
  - Portuguese
  - Spanish



# Delivered values to the various stakeholders

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- **Benefit to the authors:**

- Using an external assessment translation could be very expensive when the need of the translation is only for a small group of individuals.

**Benefit to the candidate:**

The translated texts support candidates to better understand the questions and succeed in the assessment.

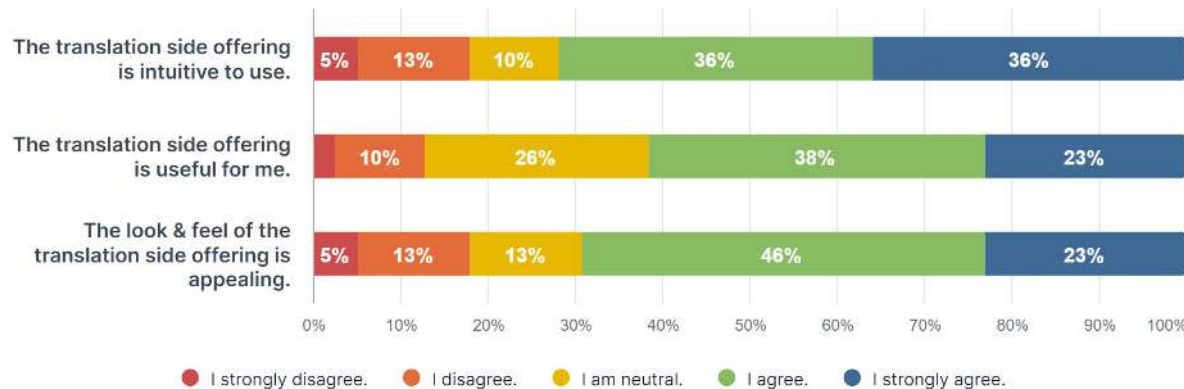
A candidate does not need to wait anymore until the original exam is translated but now has the opportunity to take the English exam that is usually published first.

**Benefit to the certification program and society:**

The innovation increases **inclusivity and diversity**, by making the exam fairer to non-native speakers who are sometimes disadvantaged by having to take exams in a language they are not native speakers in.

# Measurable results: Language choice with research feedback

From the user testing, we found that the translation of an entire screen wasn't in favor. Respondents requested base language and the target language next to each other, to be able to compare the translation with the original text.



## Positive

"We have customers around the world – this comes in handy for them."

"It was easy to use similar to what you see on websites for selecting translations."

"Simple, minimalistic view"



## Negative

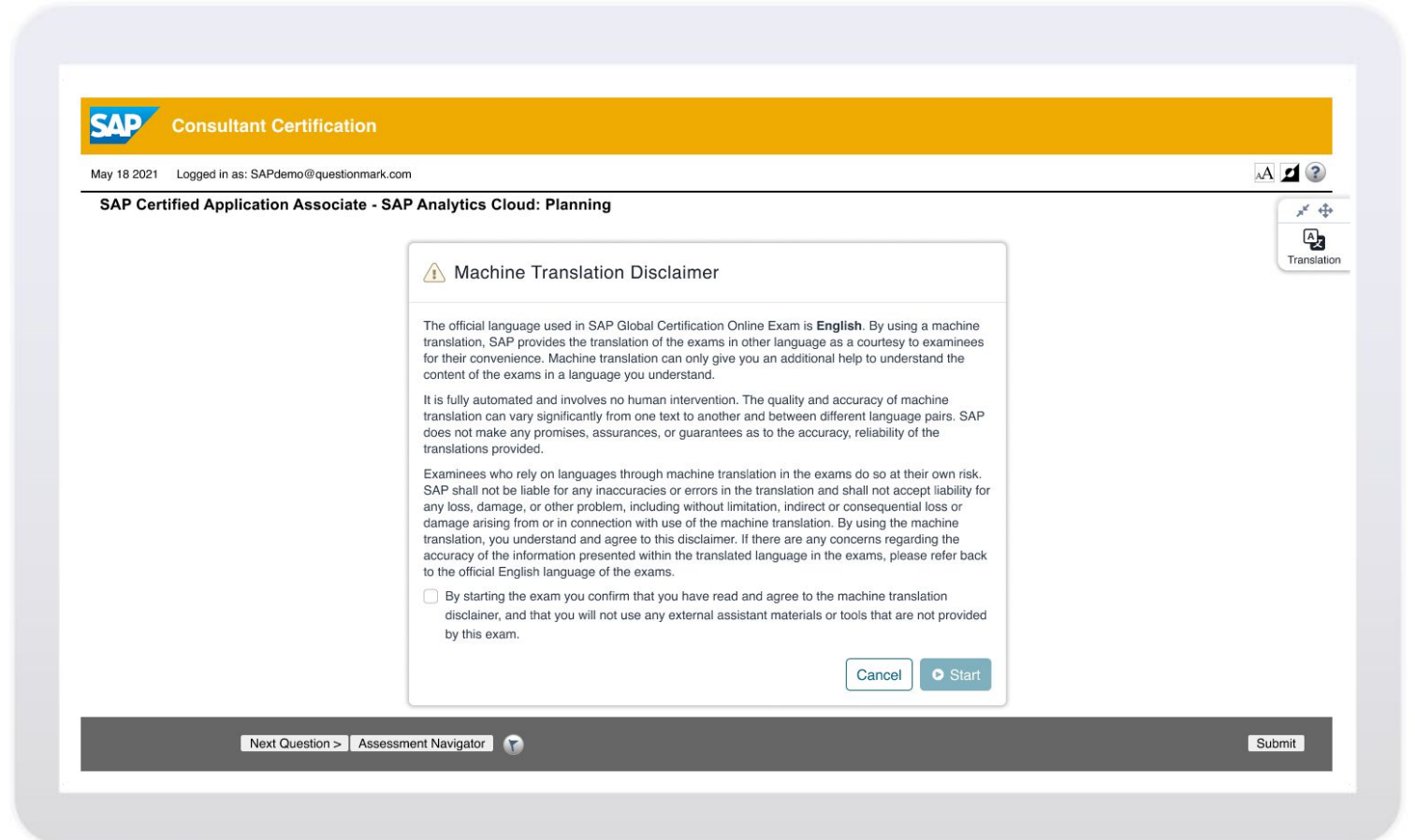
"A comparison of the translations English to Chinese"

"Could the screen be used side by side?"

"The screens, original English and MT, should be side by side. Plus, the buttons should only be with the English version."

# Lessons learned

- As the original exam is provided in English and the translation is only provided as a support aid, it is important that the user understands and agrees that relying on languages through machine translation may not be the most accurate translation.
- As a consequence it's important to include a legal disclaimer about non-accuracy of language at the start of an exam.





# New Questionmark “Instant Translate” product feature

- Fully released
- Enable for some/all tests
- Allows on the fly translation of assessment in > 22 languages
- Has won ITCC award
- Will help Questionmark users be more inclusive to those who do not speak language of test

**Winner of the 2022 ITCC  
Innovation Award**





question  
mark

# Learnosity demo

# Language bundles

- Important to future proof learning products for new markets
- Using pre-built language bundles for faster translations, with less effort, incl. Spanish, Portuguese, German, and 14 others
- Reach more learners, offer a more inclusive experience
- Customizable. Assessment and authoring environments can be manually translated into any language

## i18n and l10n support made easy

Learnosity has i18n (internationalization) and l10n (localization) support for configuration and language bundles.

This demo uses learnosity-i18n which is a public repository, containing Learnosity internationalization language bundles.

Click a language icon to see a translation of the assessment below:



More languages: [English \(UK\)](#) | [Pilipino/Tagalog](#) | [Dutch](#)

Add your own: [Documentation](#) | [Github repo](#)

### Learnosity Internationalization Demo

English

A business owner is shopping for furniture. She starts with \$2000. If she spends \$500 on an office chair and then spends \$400 on a desk, how much does she have left to spend on a meeting room table?

- ☐ \$1,900
- ☐ \$1,100
- ☐ \$600
- ☐ \$100

1 of 3 ⌚ 00:16 / 25:00 ||

Item 1

Item 2

Item 3

A vertical sidebar of icons for navigating the assessment, including arrows for back and forward, a magnifying glass for search, and other standard UI icons.

◀ Next ▶

<https://demos.learnosity.com/assessment/activities-i18n.php>

# Summary

- Important to consider support for different language speakers in assessment design
- Technology from Questionmark and Learnosity can help
- Questionmark technology has just won an ITCC award for innovation



question  
mark



# Questions

# How to Evaluate

## Request a one-on-one demo

*The team will contact you to arrange a demonstration tailored to your needs and questions:*

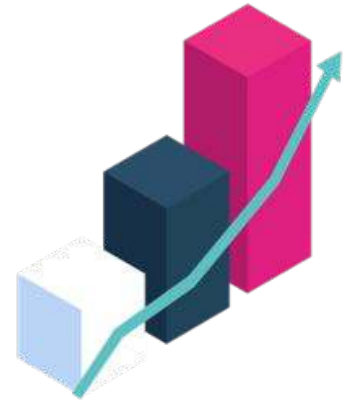
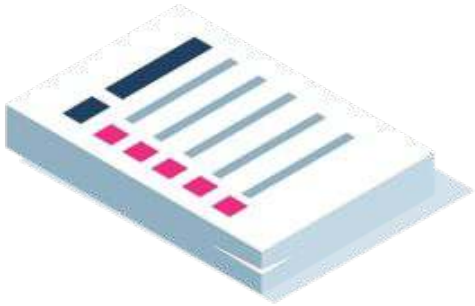
visit **[www.questionmark.com/request-demo](http://www.questionmark.com/request-demo)**

or

email **[sales@questionmark.com](mailto:sales@questionmark.com)**



# eBooks, White Papers, Infographics and more!



**[www.questionmark.com/resources](http://www.questionmark.com/resources)**





question  
mark



# Thank you for attending!

*We hope to see you at a future webinar*

Keep up to date at [www.questionmark.com/resources/blog](http://www.questionmark.com/resources/blog)