



I Use Statistics in Education



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With the support of the Lifelong
Learning Programme of the
European Union  Lifelong
Learning

Many literacies

- *Language literacy*
- *Mathematics literacy*
- *Computer literacy*
- *Ocean literacy*
- *Science literacy*
- *Critical literacy*
- *Social literacy*
- *Relational literacy*
- *Sexual literacy*
- *Spatial literacy*

And more ...



http://1.bp.blogspot.com/-4_JVJFugTgw/Ub_ME8TGkpl/AAAAAAAEXg/Rm5qoUDqYBk/s1600/information+literacy.png

Literacy as stepstone to citizenship

Education for citizenship

- **equips young people with the knowledge, skills** and understanding to play an effective role in public life
- encourages them to take an interest in topical and controversial issues and **to engage in discussion and debate.**
- learn **to take part in decision-making and different forms of action.**

They **evaluate information, make informed judgements** and reflect on the consequences of their actions now and in the future. They learn to argue a case on behalf of others as well as themselves and speak out on issues of concern

<http://www.teachingcitizenship.org.uk>

Why statistical literacy?



<http://4.bp.blogspot.com/-dBMk6ciM4QI/TgiaQ-GuaCI/AAAAAAAAAY/Hcd8IVRIOyA/s1600/Statistic%2Bcartoon.jpg>

Statistics - everywhere

- Every activity relies on statistics – one way or the other
- Today easy vivid presentations: figures, charts, living and interactive diagrams and graphs,
- Useful tool in aiding research and studies in economics, social sciences, business, medicine ...

WEILL CORNELL MEDICAL LIBRARY ANNUAL STATISTICS

COLLECTIONS

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Total Volumes (Print monographs & Serials)	172,002	175,637	178,878	180,947	184,833	188,330	190,672
Total Subscriptions (Print + Electronic)	1,607	1,611	3,141	3,330	4,234	5,458	5,912
Total Unique Electronic Full-Text Serial Titles	1,385	1,405	2,679	2,976	4,234	5,458	5,912
Total Electronic Monographic Titles (E-Books)	334	436	2,679	2,976	4,234	5,458	5,912
Collection Total Value in \$	14,000	14,200	14,300	14,400	14,500	14,600	14,700

ACCESS SERVICES

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
# of Users (Door Count)	334,821	355,833	353,102	253,425	365,030	319,829	232,199
Total Collection Use	8,402	8,402	8,402	8,402	8,402	8,402	8,402
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Items Used in Library (subset of Total Collection Use)	8,402	8,402	8,402	8,402	8,402	8,402	8,402
Items Provided to Other Libraries	8,402	8,402	8,402	8,402	8,402	8,402	8,402
Items Obtained from Other Libraries	8,402	8,402	8,402	8,402	8,402	8,402	8,402

INFORMATION SERVICES

Reference Questions	1,000
Mediated Literature Searches	1,000
# of Education Sessions	1,000
Attendance at Education Session	1,000

Total FTE Staff
* 2005-06, Reference

Trends in crime levels

Number of offences, recorded

British crime survey

Police recorded crime

Old counting rules

States with no minimum

States with minimum

Source: U.S. Department of Labor

British Crime Survey estimates a total of 9.6m offences in 2009/10

Types of crime

Violence* 22

Burglary 7

Vandalism 25

% who think crime is going up, BCS

Nationally 75%

55%

46%

50%

51%

54%

48%

42%

42%

41%

39%

36%

31%

Monthly history

Change in recorded crimes

in 2009/10 compared

Other burglary -5%

Violence against the person -4%

Sexual offences -4%

Fraud and forgery -8%

Violence against the person -4%

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you are statistics!

DATA

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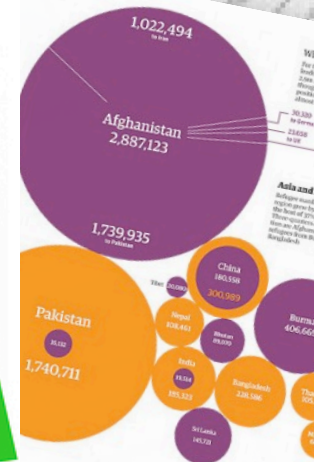
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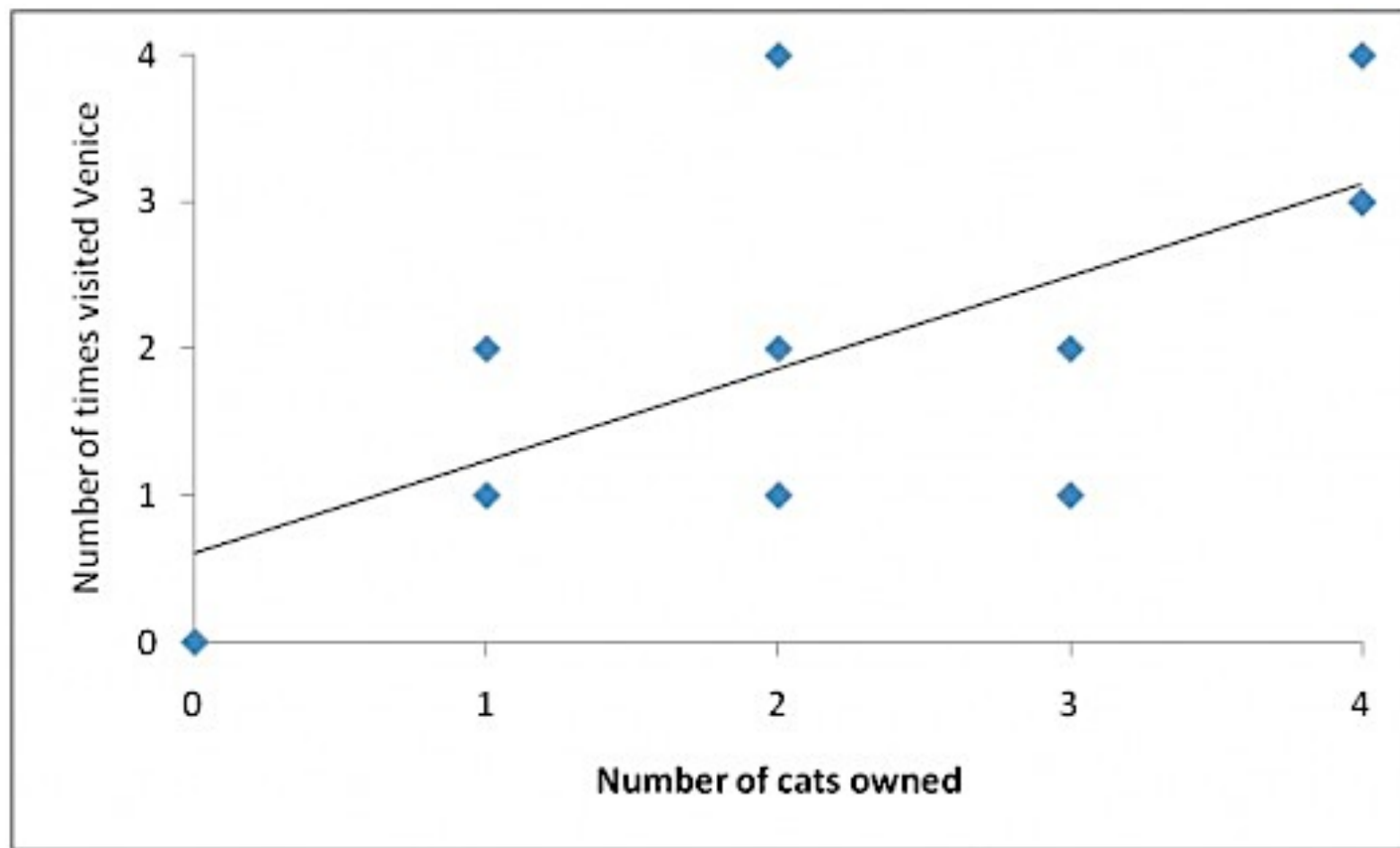
Importance and need of statistical literacy



"That's what I want to say. See if you can find some statistics to prove it."

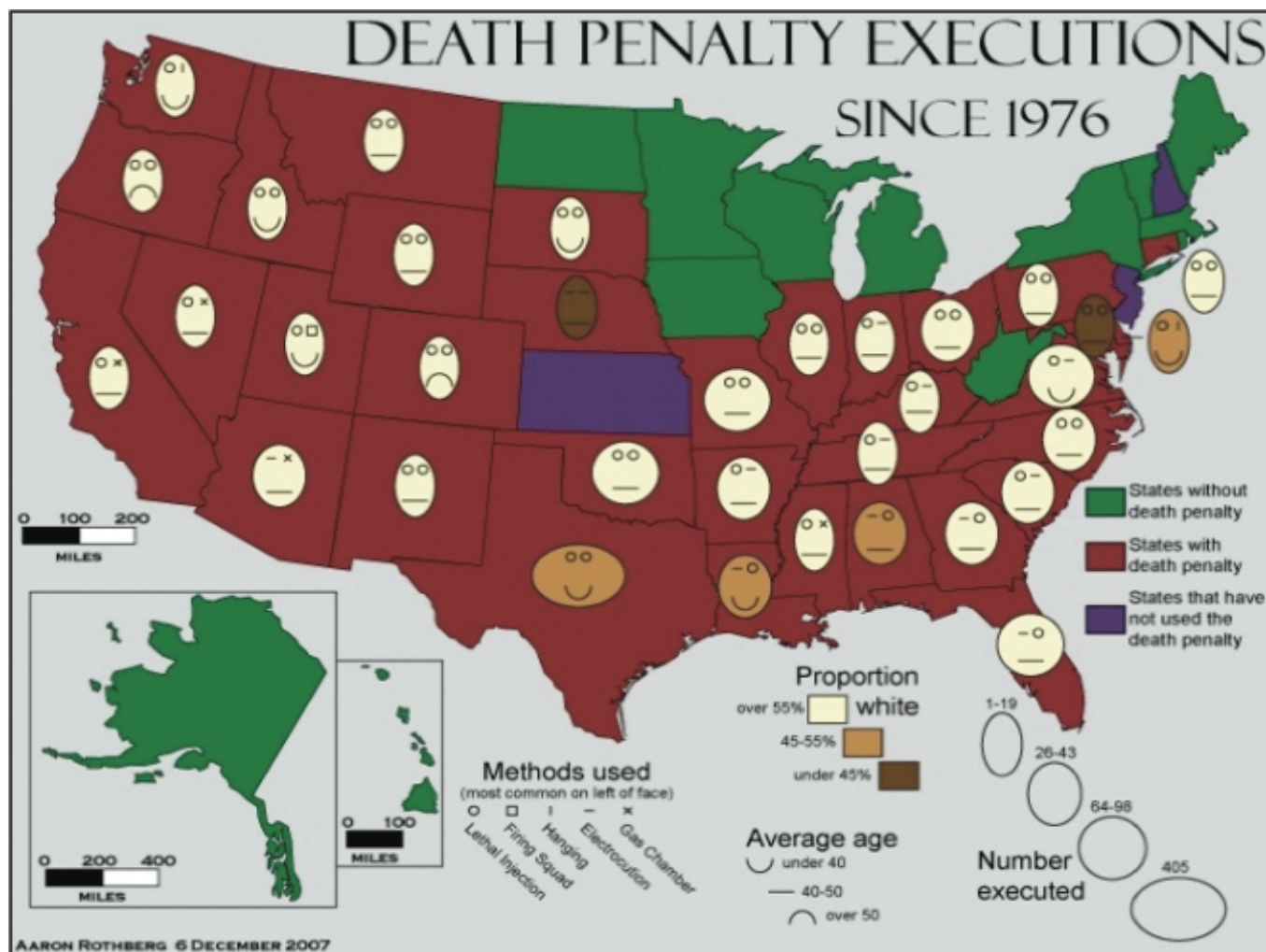
<http://streetsmartproductmanager.com/tag/product-management/>

Statistics can prove ... Anything?



<http://www.fuelyourblogging.com/how-to-prove-anything-with-statistics/>

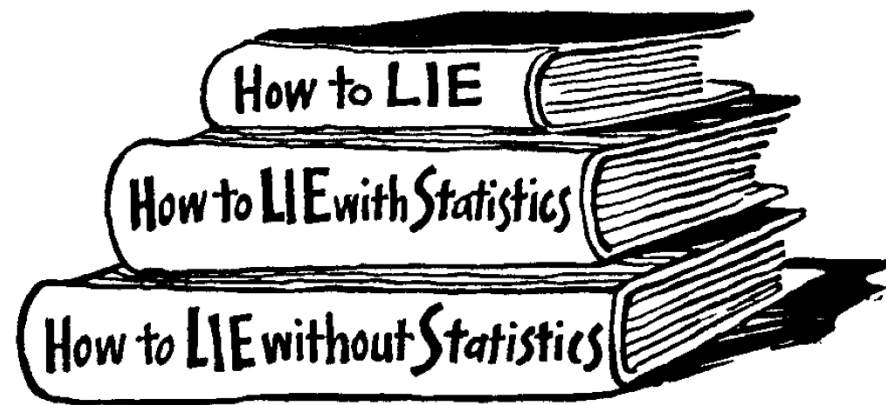
... and how is it visualised?



http://wiki.ead.pucv.cl/index.php/Archivo:02_ejemplo_cartografia_penademuerte_chernoff.jpg

Importance and need of statistical literacy

- “to be an intelligent citizen it is necessary to know something about statistics”, research of Begg and Edwards (1999) and Chick and Pierce (2008).
- Solid background to the use and interpretation of statistics in education is very important, especially in the STEM subjects



Importance and need of statistical literacy

- Statistics as a content domain is widely accepted



typically taught as part of mathematics

- Used to show a result instead of doing real analysis and investigation.

Mapping 'Statistics' across Europe: overall quantitative content analysis results

Subject Country	Maths & Statistics	History	Science (Physics, Chemistry, Biology)	Geography	Social Science (Civics, Sociology)	Economics	Total
<i>Belgium (Flemish)</i>	20	2	10	14	-	-	46
<i>Denmark</i>	26	1	5	5	14	-	51
<i>Sweden</i>	9	1	1	3	1	-	15
<i>International Baccalaureate</i>	26	1	6	6	2	-	41
<i>Greece</i>	76	28	12	74	14	66	270
<i>Czech</i>	10	-	-	5	3	-	18
Total	167	33	34	107	34	66	451

China Milliardenvolk auf engem Raum

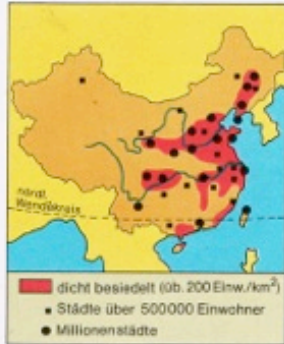


Bild 1 (Seite 121)
In Shanghai

Bild 2
Auf dem Weg zum freien Markt



Population study of China in a typical 1980's schoolbook (Diercke Erdkunde für Gymnasien in Nordrhein-Westfalen Industriestaaten und Entwicklungsländer 8, 1986)

Zhu Wu hat gut lachen. Er ist auf dem Weg zum freien Markt in der Millionenstadt Xi-an, der Provinzhauptstadt von Shaan-xi, wo er möglichst viele Hühner verkaufen will. Zhu hat heute seinen freien Tag, und da will er ein beachtliches Sümmchen dazuverdienen. Seine Frau braucht unbedingt eine Nähmaschine – möglichst eine mit Fußantrieb. In der Stadt kann man zwar auch elektrische Nähmaschinen kaufen, aber dies ist für ihn viel zu teuer.

Die Hühner auf seinem Fahrrad leben alle noch! Er kann sie doch nicht schon vorher schlachten, bevor sie verkauft sind. In seinem Dorf hat noch niemand eine Tiefkühltruhe oder einen Kühlschrank, in dem man die unverkauften Hühner lagern könnte. Er selbst kann sich nur selten etwas Fleisch oder gar Fisch zum Essen leisten. Meistens kocht seine Frau eine Reismahlzeit mit etwas Gemüse. Dazu trinkt man immer Wasser oder Tee.

Eben ist Herr Wu von einem Lastwagen der Brigade überholt worden, der Jugendliche zu einer Sportveranstaltung bringt. Solche Ausflüge bringen etwas Abwechslung in den Alltag der Menschen. Vor kurzem hat auch Herrn Wus Brigade einen Ausflug mit dem LKW zu einer alten Tempelanlage gemacht, denn Privatautos gibt es in China kaum. Auch die Mutter von Zhu durfte teilnehmen und der kleine Djiän-guo – das bedeutet »Aufbau des Landes«.



1 Wachstum und Verteilung der Bevölkerung

Herr Wu hat nur einen Sohn; aber er hätte gerne noch viele Kinder, denn er selbst ist in einer kinderreichen Familie aufgewachsen. Früher mußten gerade die Bauern viele Kinder großziehen, weil sie diese zur Arbeit brauchten. Außerdem waren die Söhne verpflichtet, für die Kranken und alten Eltern zu sorgen.

Dem Milliardenvolk der Chinesen geht es aber heute darum, die Zahl der Kinder zu senken, damit alle ernährt und beschäftigt werden können. Über 500 Millionen Chinesen sind derzeit unter 20 Jahre alt! Um das Bevölkerungswachstum »in den Griff zu bekommen«, wirbt der Staat in Rundfunk und Zeitungen und auf Versammlungen für die Ein-Kind-Ehe. »Später – seltener – weniger« lautet die Parole zur Geburtenplanung. Familien mit einem Kind werden bevorzugt behandelt: bei der Zuweisung von Arbeitsplätzen und Wohnungen sowie bei der Sicherung der Altersversorgung. Sie erhalten ein zusätzliches Monatsgehalt im Jahr, mehr Urlaub und Kindergeld. Der Besuch von Kindergarten und Schule ist kostenlos. Ab dem zweiten Kind müssen die Eltern höhere Steuern entrichten, und sie erhalten kein zusätzliches Privatland. Alle sonstigen Vergünstigungen wurden gestrichen. Ab dem dritten Kind wird das Einkommen gekürzt.

Chinas Bevölkerung wächst jährlich trotz dieser harten Maßnahmen um 1,5 Prozent! Und die Masse der Jugendlichen kommt demnächst ins heiratsfähige Alter. Bis zum Jahr 2000 soll das Bevölkerungswachstum auf Null gedrückt werden. Aber was in den Städten möglich ist, muß nicht unbedingt auf dem Lande gelingen.

Bild 3
Im Kindergarten

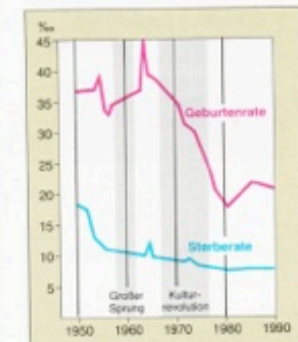
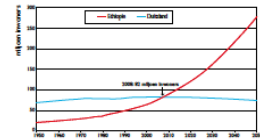


Bild 4
Natürliche Bevölkerungsentwicklung Chinas

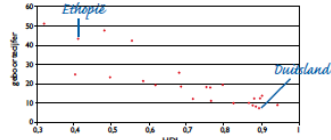
- 1.1 Beschreibe die Bevölkerungsverteilung Chinas (Atlas, Pilotkarte).
- 1.2 Nenne Maßnahmen, mit denen in China das Bevölkerungswachstum eingegrenzt werden soll. Warum lassen sich solche Maßnahmen leichter in den Städten als auf dem Lande verwirklichen?

3.7 Ontwikkelingslanden versus industrielanden: een eigen demografisch onderzoek

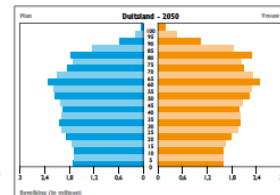
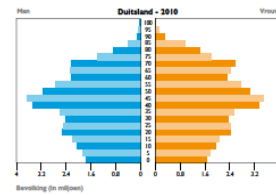
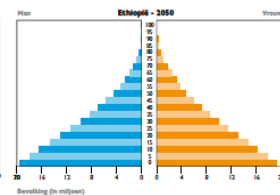
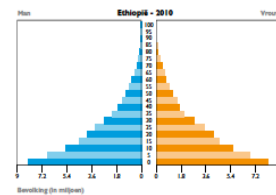
Onderzoek de evolutie van de bevolking van Ethiopië en Duitsland. Raadpleeg de tabel op p. 26 en de grafieken hieronder. Noteer je bevindingen in de tabel op de volgende pagina. Plaats eerst de namen van beide landen bij de overeenkomstige stip op fig. 1.37.



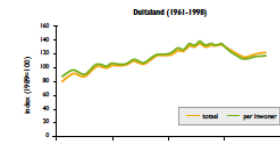
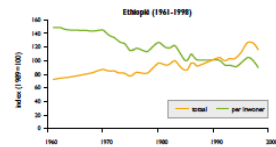
1.36 De evolutie van de bevolking in Ethiopië en Duitsland



1.37 De relatie tussen geboortecijfer in % en HDI



1.38 Leeftijdshistogrammen van Ethiopië en Duitsland in 2010 en 2050



1.39 Evolutie van de totale voedselproductie en de voedselproductie per inwoner

Uitdagingen door bevolkingsexplosie

24



	Ethiopië: een ontwikkelingsland	Duitsland: een westers industrieland
regio	sub-Sahara Afrika	West-Europa / EU
bevolking in 2008 (fig. 1.36)	82 miljoen inwoners	82 miljoen inwoners
prognose voor 2050 (fig. 1.36)	280 miljoen inwoners	75 miljoen inwoners
natuurlijke groei (tabel p. 26)	3,21 %	-0,28 %
vruchtbaarheid per vrouw (tabel p. 26)	6,07	1,42
levensverwachting (tabel p. 26)	55,8 jaar	79,4 jaar
huidige leeftijdsstructuur van de bevolking (histogrammen of atlas)	groot: brede balkjes / > 40 % (46,4 % in 2010) 51,1 % in 2010 klein: smalle balkjes < 2,5 % (2,7 % in 2010)	klein: smalle balkjes / < 20 % (13,5 % in 2010) 66,1 % in 2010 groot: brede balkjes > 15 % (20,4 % in 2010)
fase in de demografische transitie + kenmerken	GC = 49,3 %, het SC = 11,3 % Fase 2 of de vroege expansiefase	GC = 8,2 %, het SC = 11 % Fase 5 of de afnemende fase
analfabetisme (atlas)	50 - 75 %	< 5 %
armoede (atlas)	> 50 % leeft met minder dan \$ 1	< 5 % leeft met minder dan \$ 1
verstedelijkingsgraad (atlas)	< 25 % leeft in steden	> 75 % leeft in steden
evolutie van de voedselproductie	De totale voedselproductie stijgt, maar door de snelle groei van de bevolking neemt de voedselproductie per inwoner af.	Voedselproductie en bevolking stagneren, zijn in evenwicht.
draagkracht	Wordt overschreden, een groot deel van de bevolking is ondervoed en lijdt armoede.	De bevolking heeft meer dan voldoende middelen van bestaan.
maatschappelijke gevolgen van de bevolkingsevolutie	Door de zeer snelle groei van de bevolking dreigt de voedselvoorziening in gevaar te komen. De overheid die instaat voor meer werkgelegenheid, gezondheidszorg, onderwijs... voert een voortdurende wedloop tegen de tijd.	De bevolking wordt snel ouder. Er zullen te weinig actieven zijn om hen te onderhouden.
maatregelen die de overheid neemt	Voorlichting bij familieplanning, verbeteren van de welvaart (hbp/insw, onderwijs, gezondheidszorg...)	GC laten stijgen: kindergeld, voldoende opvang voor kinderen, ouderpensioen... Seniorenboom: optrekken van de pensioenleeftijd, stimuleren van pensioenparen...

Noteer hier je bevindingen i.v.m de verdere evolutie van de bevolking.

In Ethiopië en Duitsland wonen er ongeveer evenveel mensen. Ethiopië zit nog volop in de vroege expansiefase, met zeer veel geboorten en afnemende sterfte. Hierdoor kent het land een explosieve groei. Tegen 2050 zal de bevolking in Ethiopië meer dan verdrievoudigd zijn, terwijl die van Duitsland zal krimpen tot 73 miljoen. De bevolking in Duitsland is sterk verouderd en het geboortecijfer is er laag. Duitsland berijdt zich al in de afnemende fase.

25

Thema 1: Bevolking

Land	totale groei (in %)	vruchtbaarheids-cijfer (aantal kinderen per vrouw)	kindersterfte (in ‰)	levensverwachting (jaar)	HDI
Algerije	1,55	2,65	52,5	69,4	0,497
Angola	0,08	1,05	4,4	79,4	0,867
Armenië	1,17	1,05	4,4	72,3	0,764
Australië	0,49	2,19	21,9	74,5	0,718
Azerbeidzjan	3,17	1,54	16,5	54,7	0,555
Bahama's	3,2	1,42	79,4	79,4	0,885
Bangladesh	1,93	6,07	4	55,8	0,412
België	0,53	3,23	7,9	71,4	0,681
Brazilië	1,72	1,97	19,9	81,1	0,897
Bulgarije	1,38	3,17	3,3	71,4	0,681
Canada	1,1	2,05	81,4	29,9	0,404
Chad	0,08	2,28	49,1	66,5	0,585
China	1,32	28,9	66,5	71,1	0,686
Colombië	1,2	5,4	80,3	82,2	0,894
Costa Rica	2,23	2,8	75,7	53	0,618
Croatië	7,68	28,6	75,7	53	0,618
Danmark	1,29	114,5	67	75,9	0,826
Duitsland	1,41	6,7	10,3	66,2	0,766
Ecuador	2,35	10,3	16,7	73,9	0,797
Egypte	1,15	16,7	78,2	68,2	0,754
El Salvador	2,18	5,3	73,9	53	0,482
Estland	6,73	24,8	68,2	79,9	0,881
Finland	1,92	6,37	68,2	6,1	0,902
Frankrijk	2,06	4,7	79,9	78,8	0,902
Griekenland	1,22	6,1	79,9	78,8	0,902
Hongarije	1,22	4,2	79,9	78,8	0,902
India	1,22	4,2	79,9	78,8	0,902
Indonesië	1,22	4,2	79,9	78,8	0,902
Irak	1,22	4,2	79,9	78,8	0,902
Iran	1,22	4,2	79,9	78,8	0,902
Israël	1,22	4,2	79,9	78,8	0,902
Italië	1,22	4,2	79,9	78,8	0,902
Jamaica	1,22	4,2	79,9	78,8	0,902
Japans	1,22	4,2	79,9	78,8	0,902
Jemen	1,22	4,2	79,9	78,8	0,902
Jordanië	1,22	4,2	79,9	78,8	0,902
Kazachstan	1,22	4,2	79,9	78,8	0,902
Kenya	1,22	4,2	79,9	78,8	0,902
Korea	1,22	4,2	79,9	78,8	0,902
Kuba	1,22	4,2	79,9	78,8	0,902
Kuwait	1,22	4,2	79,9	78,8	0,902
Laos	1,22	4,2	79,9	78,8	0,902
Letland	1,22	4,2	79,9	78,8	0,902
Litanië	1,22	4,2	79,9	78,8	0,902
Luxemburg	1,22	4,2	79,9	78,8	0,902
Malawi	1,22	4,2	79,9	78,8	0,902
Maleisië	1,22	4,2	79,9	78,8	0,902
Malta	1,22	4,2	79,9	78,8	0,902
Mexico	1,22	4,2	79,9	78,8	0,902
Moldavië	1,22	4,2	79,9	78,8	0,902
Mongolië	1,22	4,2	79,9	78,8	0,902
Montenegro	1,22	4,2	79,9	78,8	0,902
Marokko	1,22	4,2	79,9	78,8	0,902
Nederlands	1,22	4,2	79,9	78,8	0,902
Nieuw-Zeeland	1,22	4,2	79,9	78,8	0,902
Norwegen	1,22	4,2	79,9	78,8	0,902
Oostenrijk	1,22	4,2	79,9	78,8	0,902
Oezbekistan	1,22	4,2	79,9	78,8	0,902
Oman	1,22	4,2	79,9	78,8	0,902
Pakistan	1,22	4,2	79,9	78,8	0,902
Panama	1,22	4,2	79,9	78,8	0,902
Paraguay	1,22	4,2	79,9	78,8	0,902
Peru	1,22	4,2	79,9	78,8	0,902
Polen	1,22	4,2	79,9	78,8	0,902
Portugal	1,22	4,2	79,9	78,8	0,902
Roemenië	1,22	4,2	79,9	78,8	0,902
Rusland	1,22	4,2	79,9	78,8	0,902
Saudi-Arabië	1,22	4,2	79,9	78,8	0,902
Slovenië	1,22	4,2	79,9	78,8	0,902
Spanje	1,22	4,2	79,9	78,8	0,902
Sri Lanka	1,22	4,2	79,9	78,8	0,902
Sudani	1,22	4,2	79,9	78,8	0,902
Szwajcarië	1,22	4,2	79,9	78,8	0,902
Taiwan	1,22	4,2	79,9	78,8	0,902
Tanzanië	1,22	4,2	79,9	78,8	0,902
Tekst	1,22	4,2	79,9	78,8	0,902
Togo	1,22	4,2	79,9	78,8	0,902
Tonië	1,22	4,2	79,9	78,8	0,902
Turkije	1,22	4,2	79,9	78,8	0,902
Uganda	1,22	4,2	79,9	78,8	0,902
UK	1,22	4,2	79,9	78,8	0,902
VS	1,22	4,2	79,9	78,8	0,902
Zuid-Korea	1,22	4,2	79,9	78,8	0,902

Comparative study of the characteristics of the population in a typical 2010's school workbook (Geogenie 4, editor De Boeck 2013).

Research statistics & education



**“Data don’t make any sense,
we will have to resort to statistics.”**

<http://www.vadlo.com>

Little research

- **statistical education**: mainly methodological discipline - exists not for itself but **rather to offer to other fields of study a coherent set of ideas and tools** of dealing with quantitative information
(Cobb and Moore, 1997).
- **integration of statistics implies a basic quantitative literacy and the acquisition of a set of quantitative skills**
(Batanero and Díaz, 2010)

Little research

- **Teachers' own statistical literacy** determines quality
- Teachers share a variety of difficulties and **misconceptions** with their students about fundamental statistical ideas and representations (Batanero and Diaz, 2010)
- Teachers have **difficulty in implementing an experimental approach** or teaching through statistical investigations (Stohl, 2005).

From teachers side ...

- feel students experience **greater difficulties in statistics** than other topics,
- **consider themselves not well prepared** to help their students face these difficulties.
- **traditional beliefs and a static view** of the way statistics can and should be used in class
- do **not consider new forms** of visualising statistical information **as part of curriculum courses**

From students side ...

- **not many opportunity** to work with statistics / computer-based visualisations.



- many students **not able to mean meaning** from the data and information they are presented with.

What is needed

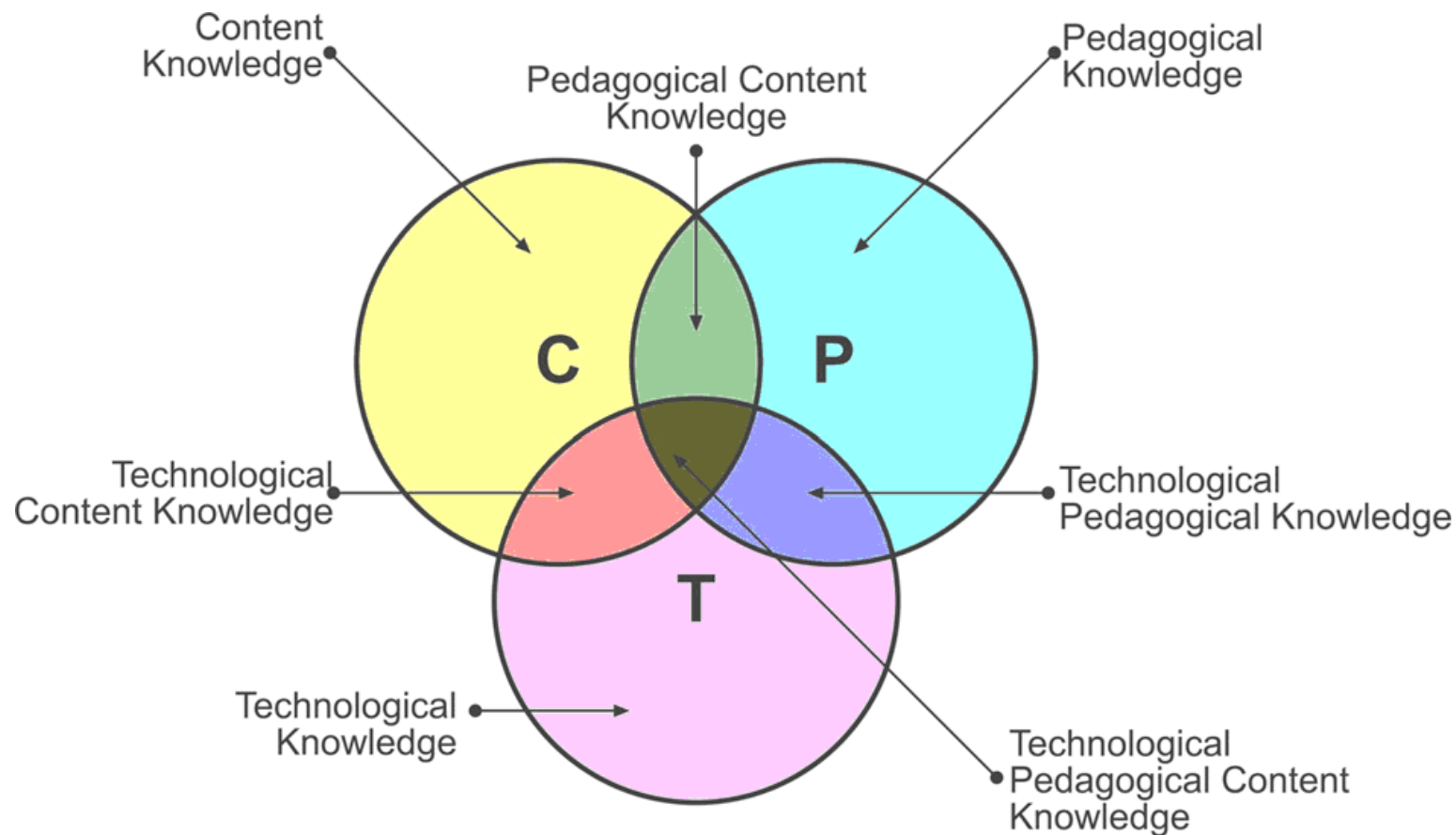
- **Promote statistical literacy and statistical reasoning** by engaging teachers with real data and training, through project work, statistical investigations and problem-based learning (Arnold, 2008)
- **Essential to work with ICT**
data is not just a series of numbers, they are numbers with a context, having investigative cycles, interrogative cycles, and characteristic dispositions (Wild and Pfannkuch, 1999).

What is needed

Technological pedagogical content knowledge model (TPCK):

- teachers need
 - technology,
 - pedagogy
 - content knowledge skills(Koehler, 2008)

What is needed



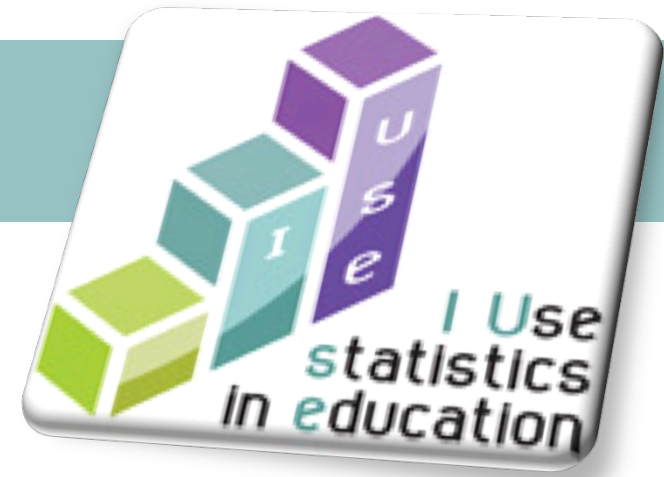
What is needed

Technological pedagogical content knowledge model (TPCK):

- teachers need
 - technology,
 - pedagogy
 - content knowledge skills (Koehler, 2008)

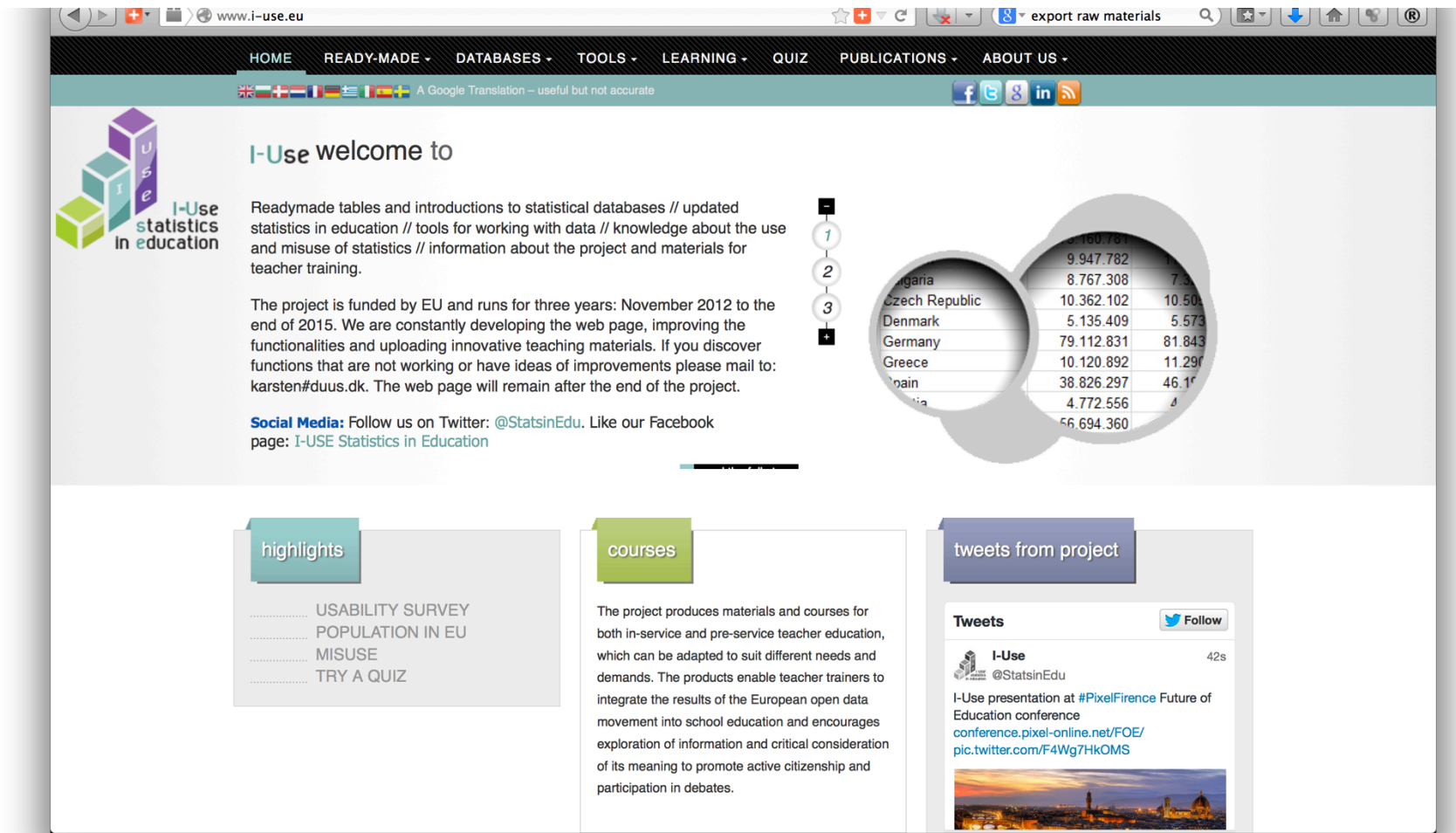


The I-Use project



- a European funded project
- led by the geography department of Ghent University (Belgium)
- partners from Belgium, Bulgaria, the Czech Republic, Denmark, Greece, Sweden and the UK.
- outcomes: website, tools, teacher training course (TPCK)

The I-Use project: website (T)



www.i-use.eu

HOME READY-MADE DATABASES TOOLS LEARNING QUIZ PUBLICATIONS ABOUT US

A Google Translation – useful but not accurate

I-Use welcome to

Readymade tables and introductions to statistical databases // updated statistics in education // tools for working with data // knowledge about the use and misuse of statistics // information about the project and materials for teacher training.

The project is funded by EU and runs for three years: November 2012 to the end of 2015. We are constantly developing the web page, improving the functionalities and uploading innovative teaching materials. If you discover functions that are not working or have ideas of improvements please mail to: karsten@duus.dk. The web page will remain after the end of the project.

Social Media: Follow us on Twitter: @StatsinEdu. Like our Facebook page: I-USE Statistics in Education

1
2
3

Uganda	8.767.308	7.3
Czech Republic	10.362.102	10.50
Denmark	5.135.409	5.573
Germany	79.112.831	81.843
Greece	10.120.892	11.29
Spain	38.826.297	46.1
Italy	4.772.556	4
France	56.694.360	

highlights

- USABILITY SURVEY
- POPULATION IN EU
- MISUSE
- TRY A QUIZ

courses

The project produces materials and courses for both in-service and pre-service teacher education, which can be adapted to suit different needs and demands. The products enable teacher trainers to integrate the results of the European open data movement into school education and encourages exploration of information and critical consideration of its meaning to promote active citizenship and participation in debates.

tweets from project

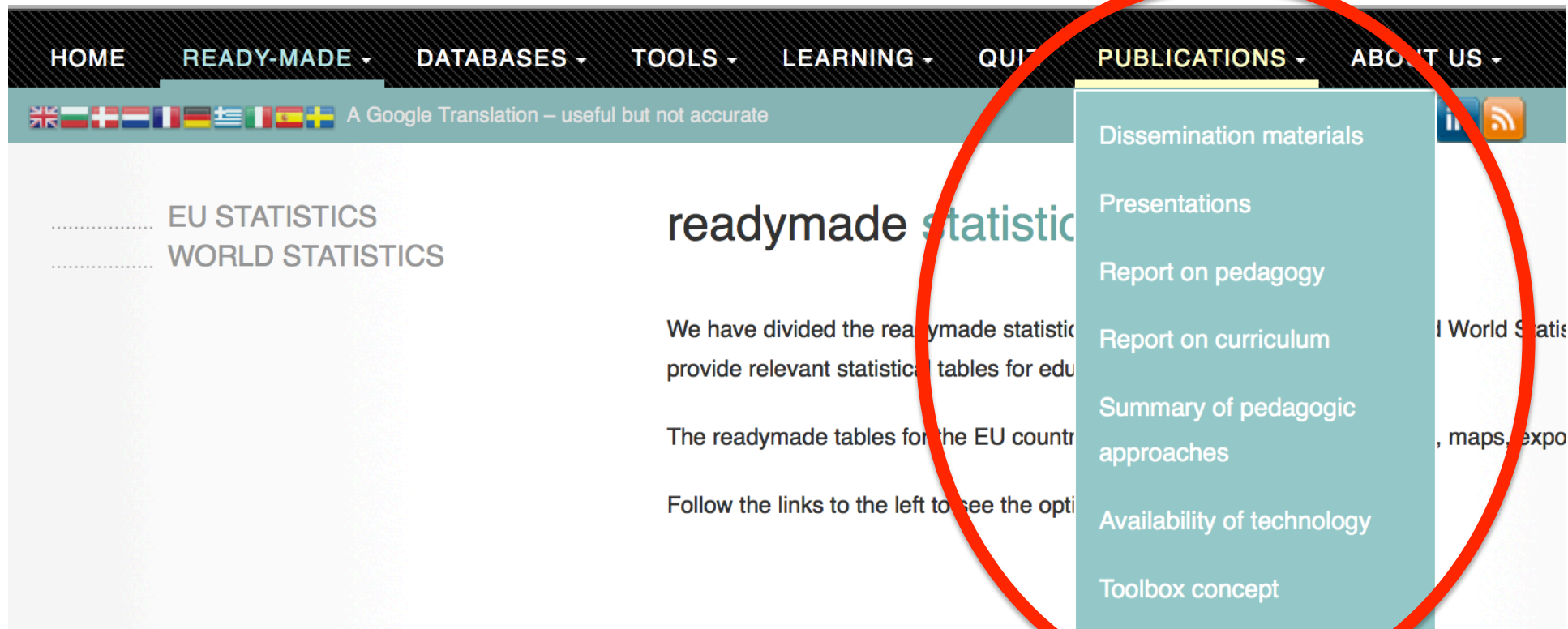
Tweets Follow

I-Use 42s
@StatsinEdu

I-Use presentation at #PixelFirenze Future of Education conference
conference.pixel-online.net/FOE/pic.twitter.com/F4Wg7HkOMS

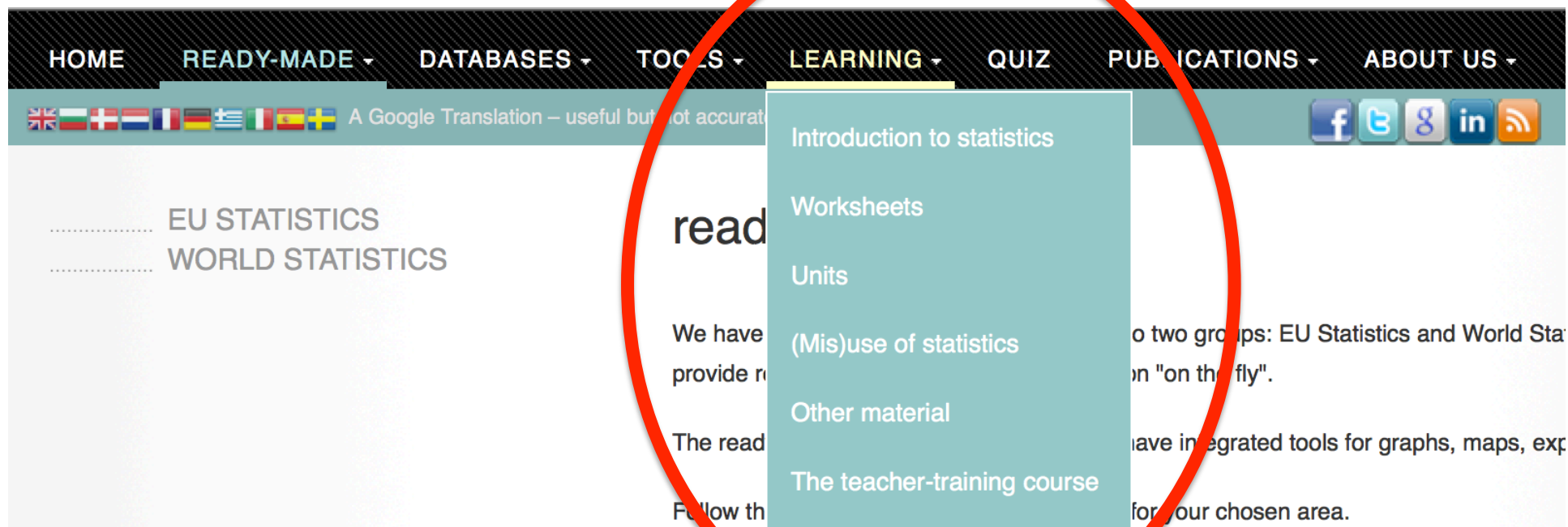


The I-Use project: website (T)

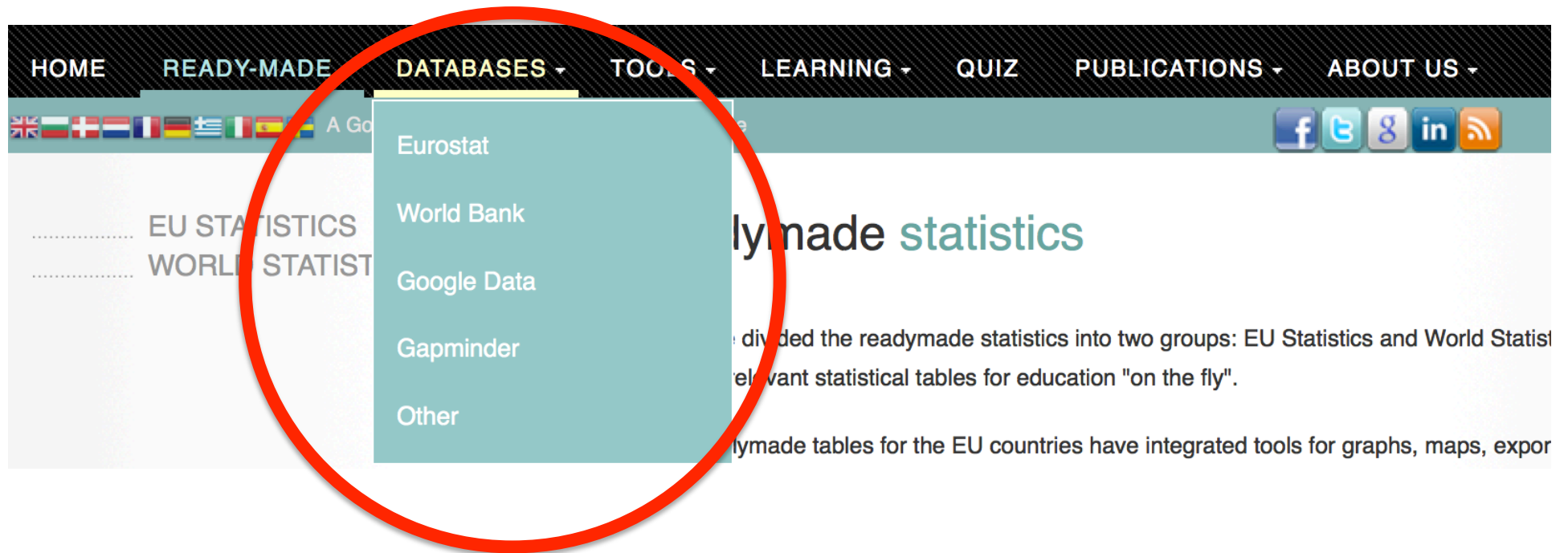


The screenshot shows the I-Use website interface. At the top is a navigation bar with links: HOME, READY-MADE, DATABASES, TOOLS, LEARNING, QUIZ, PUBLICATIONS, and ABOUT US. Below the navigation bar is a Google Translate widget. The main content area is divided into two columns. The left column contains links to 'EU STATISTICS' and 'WORLD STATISTICS'. The right column features a large heading 'readymade statistics' followed by descriptive text. A red circle highlights the 'PUBLICATIONS' dropdown menu, which lists the following items: Dissemination materials, Presentations, Report on pedagogy, Report on curriculum, Summary of pedagogic approaches, Availability of technology, and Toolbox concept.

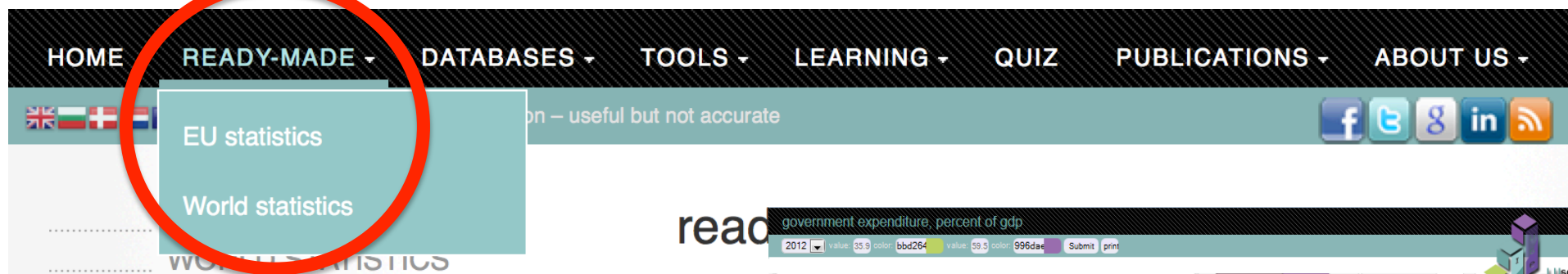
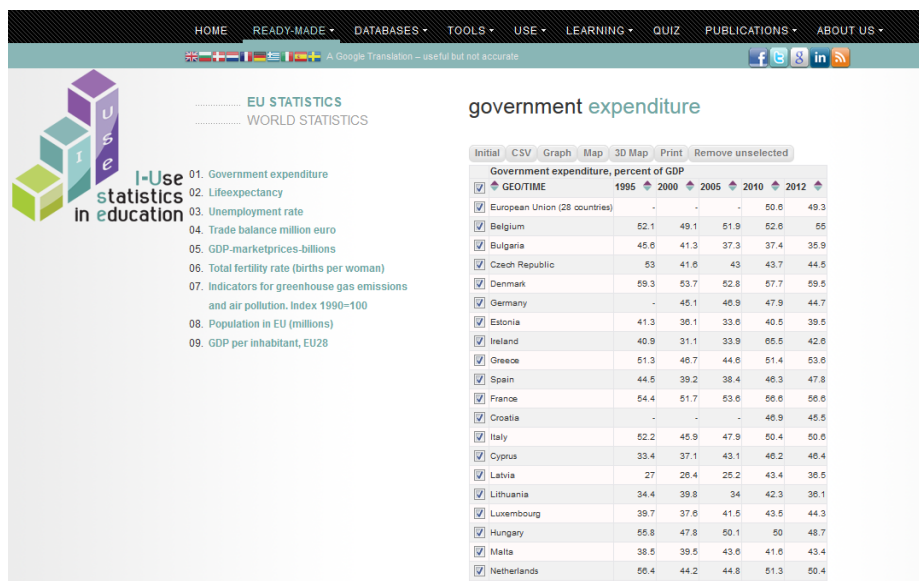
The I-Use project: website (C)



The I-Use project: website (C)



The I-Use project: website (T/C)

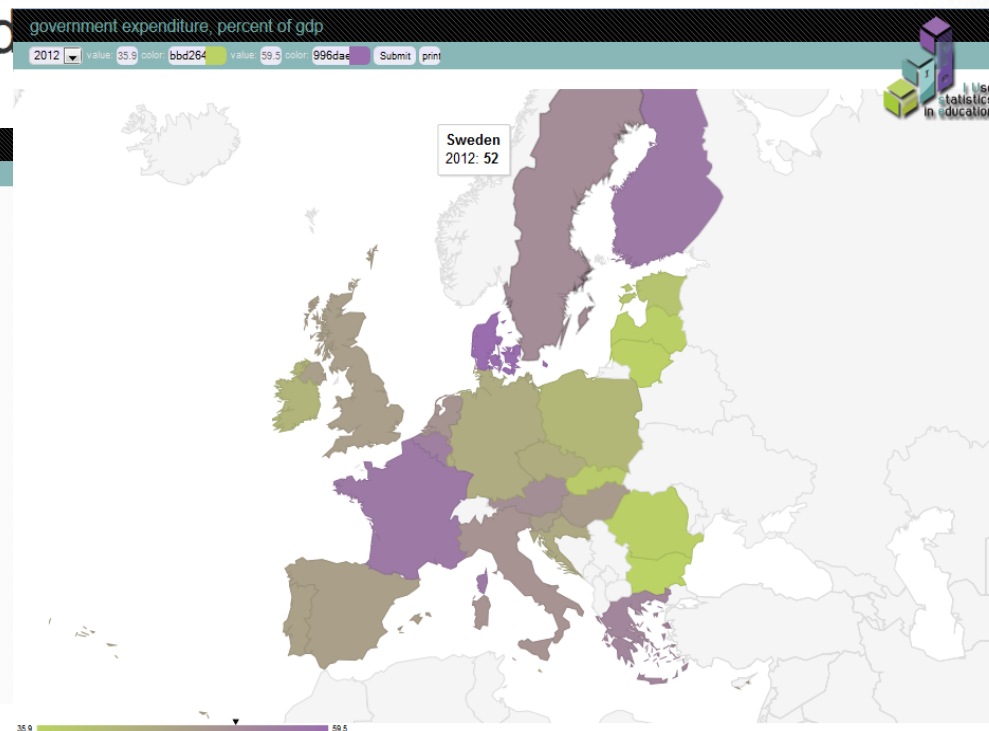
EU STATISTICS
WORLD STATISTICS

01. Government expenditure
02. Life expectancy
03. Unemployment rate
04. Trade balance million euro
05. GDP-market prices-billions
06. Total fertility rate (births per woman)
07. Indicators for greenhouse gas emissions and air pollution, Index 1990=100
08. Population in EU (millions)
09. GDP per inhabitant, EU28

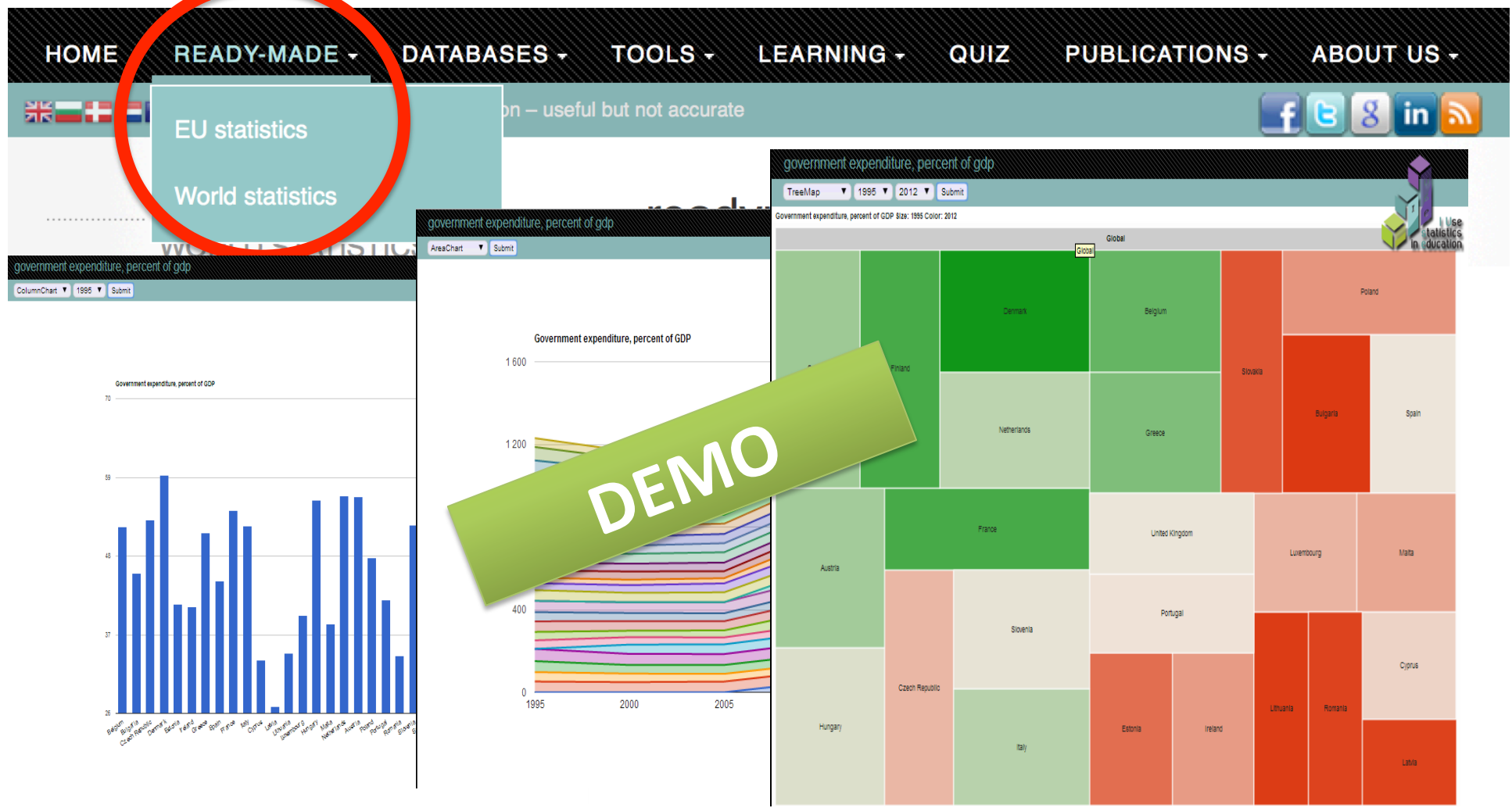
government expenditure

Initial CSV Graph Map 3D Map Print Remove unselected

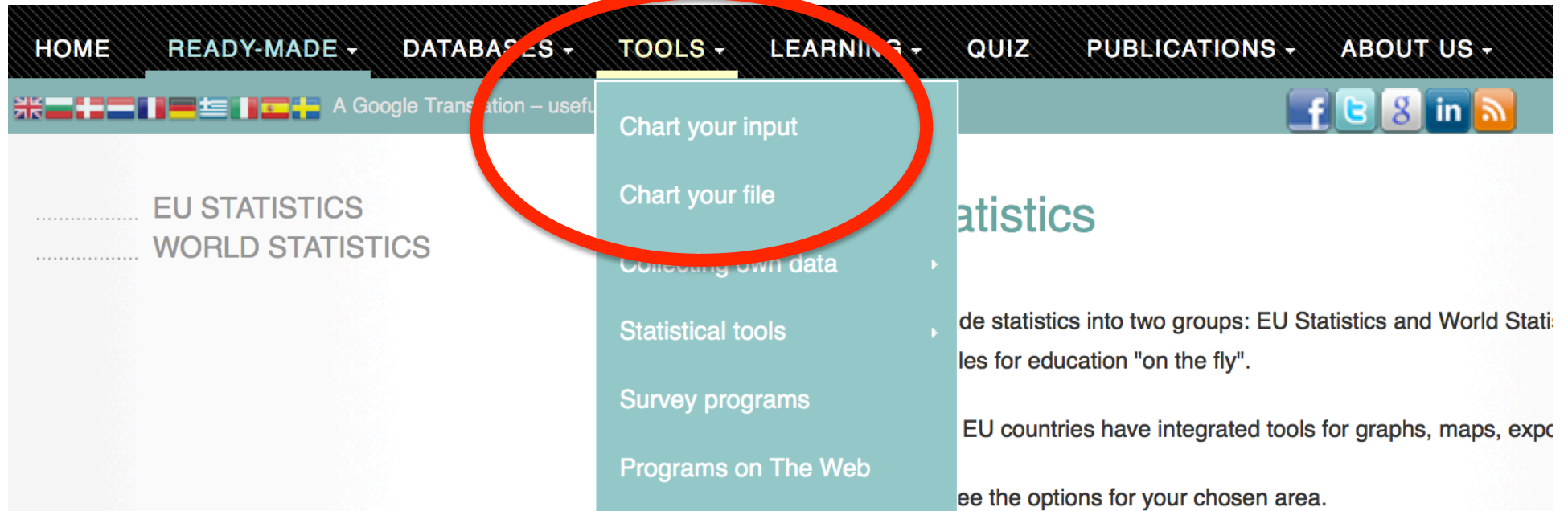
	1995	2000	2005	2010	2012
European Union (28 countries)	-	-	-	50.6	49.3
Belgium	52.1	49.1	51.9	52.6	55
Bulgaria	45.6	41.3	37.3	37.4	35.9
Czech Republic	53	41.6	43	43.7	44.5
Denmark	59.3	53.7	52.8	57.7	59.5
Germany	-	45.1	46.9	47.9	44.7
Estonia	41.3	36.1	33.6	40.5	39.5
Ireland	40.9	31.1	33.9	65.5	42.8
Greece	51.3	46.7	44.6	51.4	53.6
Spain	44.5	39.2	38.4	46.3	47.8
France	54.4	51.7	53.6	56.6	56.6
Croatia	-	-	-	46.9	45.5
Italy	52.2	45.9	47.9	50.4	50.6
Cyprus	33.4	37.1	43.1	46.2	46.4
Latvia	27	26.4	25.2	43.4	36.5
Lithuania	34.4	39.8	34	42.3	36.1
Luxembourg	39.7	37.6	41.5	43.5	44.3
Hungary	55.8	47.8	50.1	50	48.7
Malta	38.5	39.5	43.6	41.6	43.4
Netherlands	56.4	44.2	44.8	51.3	50.4



The I-Use project: website (T/C)



The I-Use project: website (T/C)



The screenshot shows the I-Use website interface. The top navigation bar includes links for HOME, READY-MADE, DATABASES, TOOLS, LEARNING, QUIZ, PUBLICATIONS, and ABOUT US. The TOOLS menu is expanded, showing options: Chart your input, Chart your file, Collecting own data, Statistical tools, Survey programs, and Programs on The Web. The main content area on the left lists EU STATISTICS and WORLD STATISTICS. The right side features social media icons and a description of the statistics tool.

HOME READY-MADE DATABASES **TOOLS** LEARNING QUIZ PUBLICATIONS ABOUT US

UK PL SE DE GR ES IT ES SE A Google Translation – useful

EU STATISTICS
WORLD STATISTICS

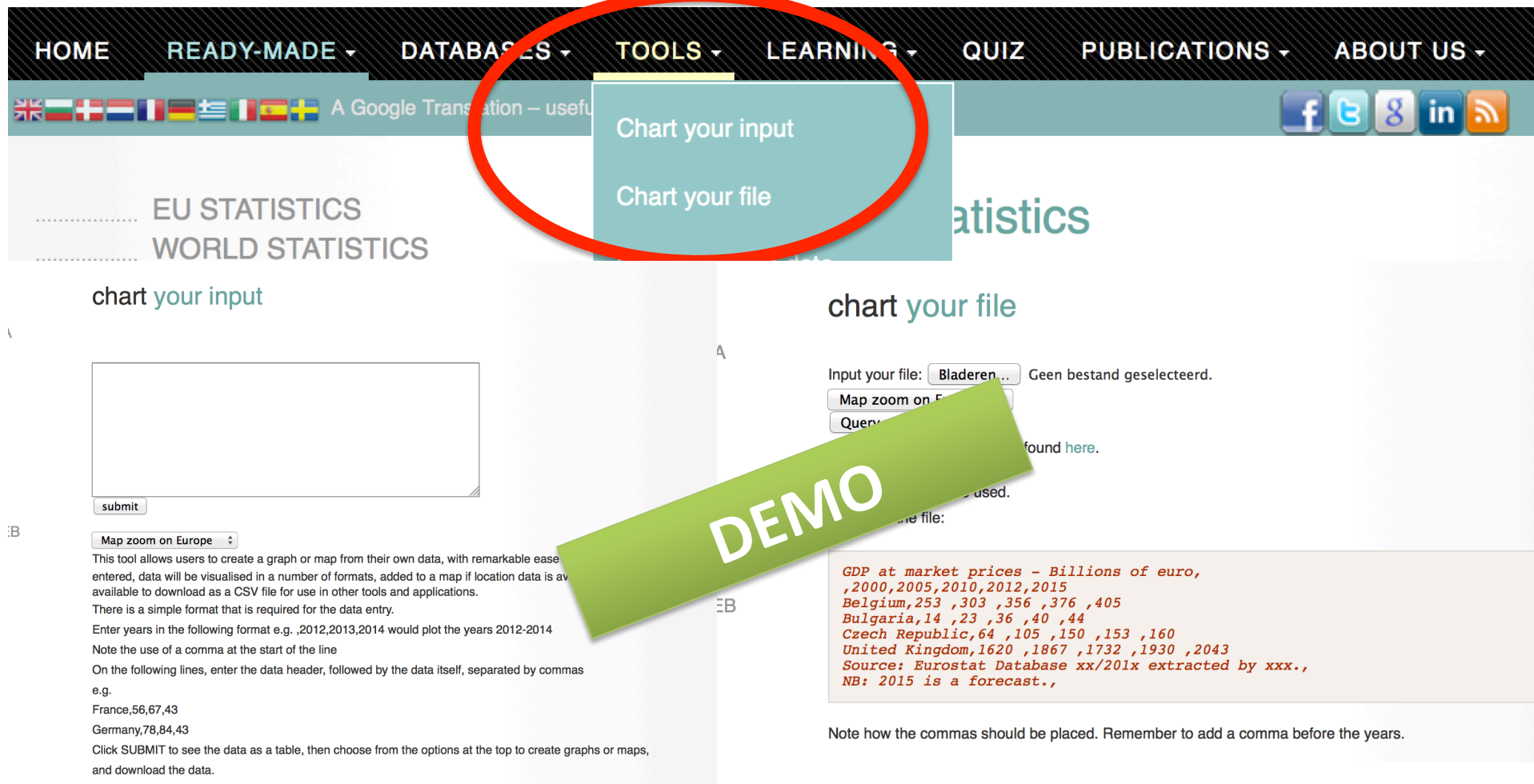
Statistics

de statistics into two groups: EU Statistics and World Statistics for education "on the fly".

EU countries have integrated tools for graphs, maps, export

See the options for your chosen area.

The I-Use project: website (T/C)



HOME READY-MADE DATABASES TOOLS LEARNING QUIZ PUBLICATIONS ABOUT US


 A Google Translation – useful
 

EU STATISTICS
WORLD STATISTICS

chart your input

submit

Map zoom on Europe

This tool allows users to create a graph or map from their own data, with remarkable ease. Once data is entered, data will be visualised in a number of formats, added to a map if location data is available and available to download as a CSV file for use in other tools and applications.

There is a simple format that is required for the data entry.

Enter years in the following format e.g. ,2012,2013,2014 would plot the years 2012-2014

Note the use of a comma at the start of the line

On the following lines, enter the data header, followed by the data itself, separated by commas

e.g.

France,56,67,43

Germany,78,84,43

Click SUBMIT to see the data as a table, then choose from the options at the top to create graphs or maps, and download the data.

chart your file

Input your file: Geen bestand geselecteerd.

Map zoom on Europe

Query

found here.

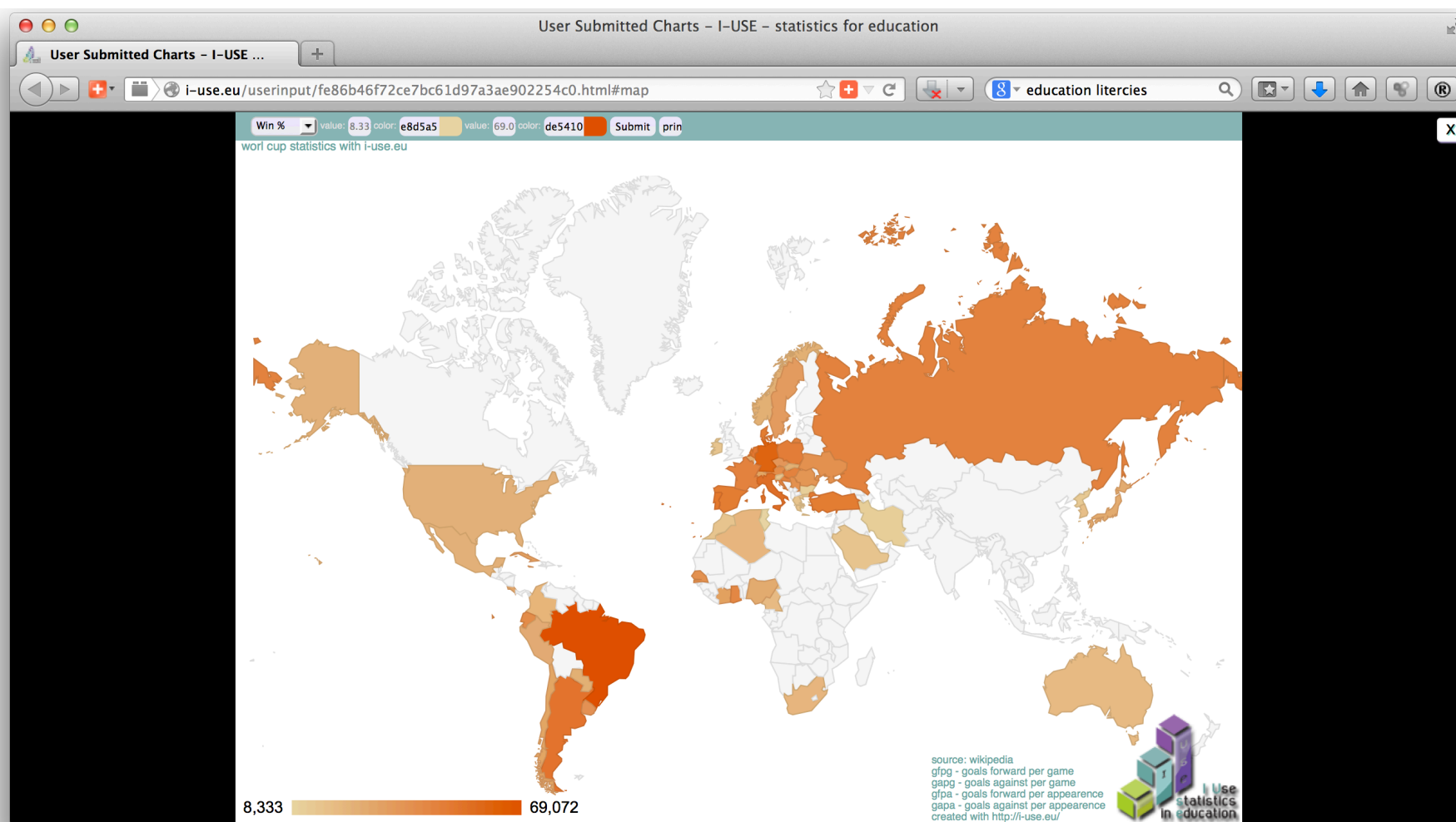
used.

file:

GDP at market prices - Billions of euro,
,2000,2005,2010,2012,2015
Belgium,253 ,303 ,356 ,376 ,405
Bulgaria,14 ,23 ,36 ,40 ,44
Czech Republic,64 ,105 ,150 ,153 ,160
United Kingdom,1620 ,1867 ,1732 ,1930 ,2043
Source: Eurostat Database xx/201x extracted by xxx.,
NB: 2015 is a forecast.,

Note how the commas should be placed. Remember to add a comma before the years.

The I-Use project: website (T/C)



The I-Use project: pedagogy – (P)

The Introduction of Use of Statistics in Education (I-Use):
the case of Use of Statistics in the Geography Curriculum

	settings.
Batanero and Diaz (2010)	Teachers have static view of the way that statistics can and should be used in class
Roberts' Review (2002)	Shortage of statisticians in the workplace.

One of the implications of the problems summarised in Table 2 was a movement to socially – based curriculum frameworks and towards applications-based approaches to teaching students to think critically about social situations in which data are used, sometimes referred to as applying statistical literacy.

6 Review of recommendations and suggested strategies

If we want to improve the teaching of statistics we need to adopt changes implementing students to receive training that is both up-to-date and relevant for society's needs. Table 3 provides a list of some reform-based strategies and techniques, brief descriptions and examples of how they are used.

Table 3. Overview of Reform-Based Learning Strategies and Techniques
(after Tishkovskaya and Lancaster, 2010; 2012)

Suggested Strategy	Examples of Use
Integrating schemes for assessment of statistical thinking and statistical literacy in to the curriculum (Gal, 2002; Schield, 2004; Watson, 1997)	Using media reports and newspapers articles to assess students' ability of interpretive statistical thinking.
Shifting the focus of statistics curricula from mathematical calculations to tasks of practical nature (Chance, 1997)	Students are given problems within different contexts so they exercise what they have learned in a variety of ways. Consider real world examples and applications.
Developing problem-solving skills. (Garfield 1993; 1995; Marriott et al., 2009)	Implement problem-based learning strategies giving students open-ended problems and taking the role of 'facilitator' in the learning process. Use of real life examples in project work.
Developing strategies to motivate students (Garfield 1993; Watson, 1997)	Provide examples that have recently appeared in the media, government reports, news.
Developing statistical literacy and critical thinking skills. (Walton, 1993; Gal, 2002, Schield, 2004, Arnold, 2008)	Include statistical literacy component in the statistical course. Focus on everyday arguments that use statistics as evidence

L. Zwartjes, K. Dooet, A. Kloos

	Use examples of incorrect analyses.
--	-------------------------------------

Suggested Technique	Examples of Use
Collaborative learning. (Garfield, 1993; 1995)	Students work, together to solve problems or discuss concepts, sharing ideas and understanding. Collaborative group work with computers.
Active learning and introducing activities where students are able to construct knowledge. (Garfield, 1993)	Students are engaged in data collection, reflection on and exploration of statistical concepts, and solving problems on their own. Small-group cooperative learning (as one of the ways for teachers to incorporate active learning)
Emphasis on exploration (Batanero and Ben Zvi, 2011)	Students posing their own questions, interrogating the data and learning new information about the real world (
Target misconceptions through discussion and assessment. (Chance, 1997; Garfield, 1995)	Instructions designed so that students will be encouraged to discuss their misconceptions. Introduce interactive assignments with feedback.
Developing the skill of communicating statistics (Schield, 2004)	Translate and present complex concepts into a format understandable to a wide audience. Ask students to explain terminology and to interpret the statistical results in everyday words
Use of TPACK model (Batanero et al., 2011; Lee, Hellebrands and Wilson, 2010)	Using a model of technological and pedagogical content knowledge that takes in account the statistical reasoning and concerns the pedagogical expertise for the effective engaging students in learning with technologies
Use of technology and on-line resources. (Garfield, 1995; Mills, 2002; Lee & Hellebrands, 2008)	Presentation of new material with the use of statistical software Simulation programs which allow students to explore statistical concepts in discovery-world environments Using useful resources available online.

The I-Use project: pedagogy (P)

introduction:

- role and value of statistical information,
- visualisation and its use

4 modules on statistical literacy and quantitative thinking,

- examples of the use of statistics in different curriculum areas
- explicit reference to responsible citizenship,

online manual to help teachers to handle the materials and include them in curricula beyond the project.

Next steps

- pilot course Mytilini
September 2014

Erasmus + KA1

- Final course, open as
KA1 course
7-11 September 2015
Helsingør, Denmark



Want more info

- www.i-use.eu
- luc.zwartjes@ugent.be

