

## MATHEMATICAL TOOLS FOR MONITORING ERASMUS+. COMPARATIVE RESEARCH WITH VET KA102 DATA IN FRANCE, GERMANY, ITALY, SPAIN AND THE UNITED KINGDOM.

### HERRAMIENTAS MATEMÁTICAS PARA MONITORIZAR ERASMUS+. ESTUDIO COMPARADO CON DATOS FP KA102 EN FRANCIA, ALEMANIA, ITALIA, ESPAÑA Y REINO UNIDO.

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#### ABSTRACT

Erasmus+ fosters the creation of a common education framework for the European Union. The mathematical tools proposed by the present research can be used to evaluate equity in all the of the Erasmus+ key actions, comparing the equity in the funds' distribution between the countries participating in the Erasmus+ programme and its evolution over time.

The text analyses the distribution of Erasmus+ KA102 VET funds and evaluates if this distribution is being done fairly, with equity. This analysis has been done with mathematical tools proposed by the author that provide information from three different perspectives: the impact of the funds on the students (Students with a Fair Access to Funds – SFAF), the regions NUTS1/NUTS2 (Regional Mobility Efficiency-RME) and the nations (National Equity – NE). The countries studied in the current research are France, Germany, Italy, Spain and the United Kingdom. These five countries contain more than half of all the vocational education and training students in the European Union. Also, these countries had the most students participating in mobilities during the previous Leonardo da Vinci programme. Hence, it is possible to consider that the conclusions of the current research offer a significant image of the situation of VET mobilities in Europe.

**Key words:** Comparative Education, Vocational Education and Training, Equity, Erasmus+, European Union.

#### RESUMEN

Erasmus+ fomenta la creación de un espacio común de formación en la Unión Europea. Las herramientas matemáticas propuestas sirven para evaluar la equidad en todas las acciones clave de Erasmus+, comparando la equidad de la distribución de fondos en los países participantes del programa y a lo largo del tiempo.

Como ejemplo, analizamos la distribución de los fondos Erasmus+ para FP KA 102. Valoramos el grado en que esta distribución se hace de forma equitativa. Este análisis se realiza mediante las herramientas matemáticas propuestas que aportan información desde tres perspectivas diferentes: el impacto de los fondos en los estudiantes (Students with a Fair Access to Funds – SFAF), en las regiones (Regional Mobility Efficiency-RME) y a nivel nacional (National Equity – NE). Los países analizados son Francia, Alemania, Italia, España y Reino Unido. Estos 5 países aportan más de la mitad de los estudiantes de formación profesional en la Unión Europea. Además, son los países que más alumnos movilizaron en el programa previo Leonardo da Vinci. Por ello, es posible

considerar que las conclusiones obtenidas son significativas a la hora de analizar el conjunto de la movilidad de la formación profesional en Europa.

**Palabras clave:** Educación Comparada, Formación Profesional, Equidad, Erasmus+, Unión Europea

## INTRODUCTION

Erasmus+ integrates former programmes like the Life Long Learning Programme, Youth in Action, and the different international Higher Education and Sport programmes. Erasmus+ started in 2014 and will be active until 2020. It is the European programme in charge of fostering the development of transnational programmes in the areas of education, training, sport and youth policies. Erasmus+ is focused on the adaptation to a fast-changing world, tackling youth unemployment and preparing the workers for highly skilled jobs. Erasmus+ intends to demonstrate that it is better to invest at a European rather than at national level and proposes to focus on the people, institutions and systems, creating transnational synergies.

The current project analyses the funding process during the first 3 years of the programme and makes recommendations that can be used to improve Erasmus+ during the second half of the programme, from 2017 to 2020. “The Copenhagen Declaration”, convened in Copenhagen on 29 and 30 November 2002, by the European Ministers of Vocational Education and Training, and the European Commission, was focused on improving European cooperation in vocational education and training and started the renovation of VET in Europe. The “Bologna process” has managed to transform Higher Education in Europe, but the “Copenhagen process” is still nowadays trying to make VET in Europe converge.

Europe 2020 Strategy for the present decade, 2011-2020, is marked by the 2008 financial crisis and the aim to develop the knowledge-based economy defined in the Lisbon Agenda. Education focuses on key competences that include 'traditional' skills such as communication in one's mother tongue, foreign languages, digital skills, literacy, and basic skills in maths and science, as well as horizontal skills such as learning to learn, social and civic responsibility, initiative and entrepreneurship, cultural awareness, and creativity. The European Union - EU is currently facing a great challenge.

### 1. MATHEMATICAL TOOLS FOR MONITORING ERASMUS+

The mathematical tools proposed by the present research can be used to evaluate equity in all the of the Erasmus+ key actions, comparing the equity in the funds' distribution between the countries participating in the Erasmus+ programme and its evolution over time. To demonstrate the validity of these tools, the present research analyses KA102 in five European countries.

The text analyses the distribution of the Erasmus+ KA102 VET funds and evaluates if this distribution is being done fairly, with equity. This analysis has been done with mathematical tools proposed by the author that provide information from three different perspectives: the impact of the funds on the students (Students with a Fair Access to Funds – SFAF), the regions NUTS1/NUTS2 (Regional Mobility Efficiency-RME) and the nations (National Equity – NE).

The vocational education and training sector has two different funding programmes that foster the mobility of students, teachers and staff. On one hand, Key Action 1 – KA103 provides grants in Higher Education. Higher Education in Europe includes university studies and VET training schemes offered at professional colleges. In some countries, universities offer HE VET studies and/or some professional colleges may provide degrees like those that can also be found at universities. For example, this is the case of the *Formación Profesional de Grado Superior* in Spain. These different institutions and the universities apply for the same KA103 call. As Higher Education institutions offer a heterogeneous collection of information difficult to standardize, their data has

not been considered in the present study. On the other hand, Key Action 1 – KA102 only provides grants to institutions working in initial vocational education and training, at secondary level. This is the reason why the present study has focused on the KA102 projects.

Each KA102 project can include mobilities dealing with students, teachers and staff. The details of how the budget of each project is split are not always available. Nevertheless, one can assume that the end beneficiary of the outcomes of the KA102 projects will always be the students of the region where the funds land. The mobilities are not assigned to students, teachers and staff to improve their education and employability on an individual basis. On the contrary, the outcomes of the KA102 target on improving the situation of the vocational education and training in the funded institutions and their regions as a whole. Thus the end beneficiaries are the present and future students located in the areas that receive the funds, even if they personally do not take part in any mobilities. Current reports and information provided by the different stakeholders only focus on the amount of mobilities and projects allocated in each region and country. In the present study, the amount of students in each region has also been taken into account.

The objective of this study is to determine if the funds are being distributed homogeneously throughout the regions of France, Germany, Italy, Spain and the United Kingdom. If funds are being unevenly delivered it could result in an inequity situation, students living in specific regions might have greater chances to benefit from KA102 funds; other students might have less opportunities to benefit from them. To simplify KA102, institutions with KA102 experience can apply for the “Erasmus+ VET Mobility Charter”. This charter enables the holders to simplify their future applications and they will apply under KA116 instead of KA102. Thus, funding values for KA116 have also been into account in this research.

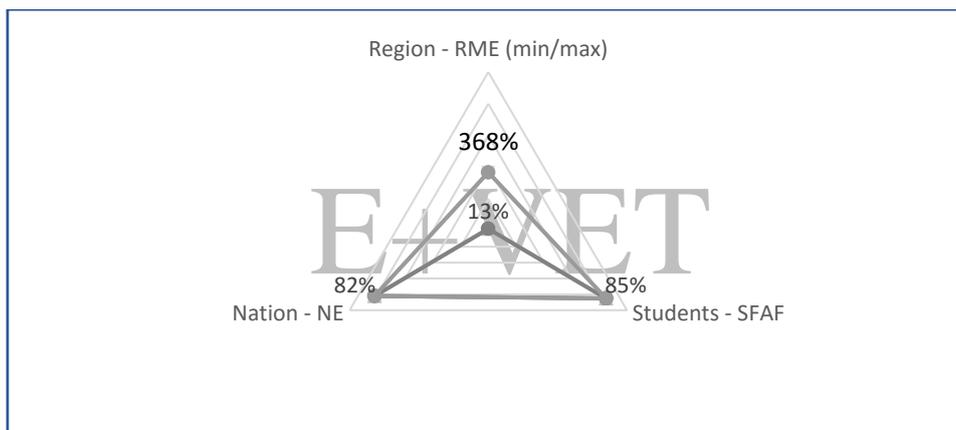
European funding programmes have the objective of redistributing wealth throughout the continent. These programmes aim to help disadvantaged groups. VET students are the target group of the KA102 funding call. It would make sense to distribute these grants homogeneously throughout all the European regions and the mathematical tools proposed in the current project show the inequities at an individual (students), regional and national level.

### 1.1 THE THREE PERSPECTIVES: REGION, STUDENT AND NATION

In the present study, the funding data and regional amount of the students has been processed to obtain three perspectives:

- Region; how are the different regions performing, which are receiving on average more funds per students, which are receiving less.
- Student; how many students have a fair possibility to benefit from the Erasmus+ funds.
- Nation; in what degree is each nation distributing the funds homogeneously.

These three perspectives are analysed with the tools described in this text (Regional Mobility Efficiency, Students Fair Access to Funds and National Equity) and presented in this document in different forms, among others as radar charts.



Example: Radar chart with the German average values for the period 2014/2016 of the National Equity, the Students Fair Access to Funds and the minimum and maximum Regional Mobility Efficiency (RME values presented 10 times smaller) values assigned to their regions

To monitor Erasmus+ this research proposes to track specific key indicators that help understand how are the funds being distributed. These key indicators are listed on the table 1.

Table 1. Monitoring Erasmus+. Key indicators

	France	Germany	Italy	Spain	UK
National budget (€)	SPACE FOR DATA				
<b>Number of projects</b>					
Biggest Project					
Smallest Project					
Average Project					
Projects / Region					
€/ Region					
Amount of projects that represent 20% of the budget					
... percentage of nations total					
Amount of projects that represent 50% of the budget					
... percentage of nations total					
Most frequent size, in % of national budget					
amount of frequent size projects					
amount of frequent size projects, % over total					
... and represent % of the total budget					
Students in regions with more than the national average budget					
Students in regions with less than the national average budget					

Students in regions with more than double the national average budget  
 Students in regions with less than half the national average budget  
 Students in regions with no access to funds  
**Students with a Fair Access to Funds – SFAF**  
**National equity**  
 Regions  
 Regions with biggest project greater than 30%  
 ... percentage of nations total  
 Regions with biggest project greater than 50%  
 ... percentage of nations total  
**Institutions that have always received funds (2014/2016)**  
**Average projects per institution (2014/2016)**



Source: Compiled by the author. Key indicators that describe the situation of the funding procedures of nations.

## 1.2 REGIONAL MOBILITY EFFICIENCY – RME

This project proposes the Regional Mobility Efficiency – RME index to illustrate the equity/inequity of the funds that are being assigned to each of the regions. The RME index indicates if a particular region is receiving more or less funds per student ( $Funds\ per\ Student_{Region}$ ) than the total national funds per student average ( $Funds\ per\ Student_{Nation}$ ).

### EQUATION 1 REGIONAL MOBILITY EFFICIENCY – RME

$$Funds\ per\ Student_{Nation} = \frac{Funds_{Nation}}{Students_{Nation}}$$

$$Funds\ per\ Student_{Region} = \frac{Funds_{Region}}{Students_{Region}}$$

$$RME = \frac{Funds\ per\ Student_{Region}}{Funds\ per\ Student_{Nation}} (\%)$$

RME values greater than 100% indicate that the region is receiving more than the national average, RME values smaller than 100% indicate the region is receiving less than the national average. Values of  $RME > 200\%$  indicate the region is receiving more than double the national student

average. Values of  $RME < 50\%$  indicate the region is receiving less than half the national student average.

Example: In 2014, in Germany there were 3,863,645 VET students. The German Erasmus+ National Agency, “*Nationale Agentur Bildung für Europa beim Bundesinstitut für Berufsbildung*” awarded that year the amount of 33,024,172 €.

$$Funds\ per\ Student_{Nation} = \frac{Funds_{Nation}}{Students_{Nation}} = \frac{33,024,172\ €}{3,863,645} = 8,55\ €/student$$

The region of Brandenburg had 70,313 students and received 744,069 €.

$$Funds\ per\ Student_{Region} = \frac{744,069\ €}{70,313} = 10,58\ €/student$$

Substituting these values in the RME equation:

$$RME = \frac{Funds\ per\ Student_{Region}}{Funds\ per\ Student_{Nation}} = \frac{10,58}{8,55} = 124\ %$$

This means that the Brandenburg region received per student more VET Erasmus+ funds than the national average.

### 1.3 STUDENTS WITH A FAIR ACCESS TO FUNDS - SFAF

According to the Cambridge Dictionary something is fair if “...it is reasonable and is what you expect or deserve” (CAMBRIDGE UNIVERSITY PRESS, 2016). As a “Fair Access to Funds” could have different meanings for every student and as every individual has a biased opinion on what is fair it is impossible to determine a universally exact value for this indicator. Even Unesco addresses equity and fairness in education with global terms, without offering specific limits:

Equity in education is the means to achieving equality. It intends to provide the best opportunities for all students to achieve their full potential and act to address instances of disadvantage which restrict educational achievement. It involves special treatment/action taken to reverse the historical and social disadvantages that prevent learners from accessing and benefiting from education on equal grounds. Equity measures are not fair per se but are implemented to ensure fairness and equality of outcome. (UNESCO, 2015).

The author has taken the risk of setting a band of “fair regions”. The subjective decision taken is to define regions as fair when the students of these regions have access to more than half and less than double the national funds per student average. In other words, in the present research regions are being funded fairly when their RME is greater than 50% and smaller than 200%. Adding up the number of students located in the fair regions of a nation, it is possible to determine how many of the students are being offered a fair possibility to access funds.

This project defines the Students with a Fair Access to Funds – SFAF as the national percentage of students located in the regions of a nation with values of RMEs between 50% and 200%.

## EQUATION 2 STUDENTS WITH A FAIR ACCESS TO FUNDS – SFAF

$$SFAF_{nation}(\%) = \sum_{50\% \leq RME_{region} \leq 200\%} 100 \cdot \frac{Students_{region}}{Students_{nation}}$$

Having regions with a great amount of VET Students with a Fair Access to Funds – SFAF would mean a great amount of VET students could have the opportunity to benefit from the outcomes of these KA102 programmes, even if they do not personally take part in mobilities. These students will study in regions where teachers, staff and other students will be travelling abroad, bringing back knowledge and best practices that will improve their local training sector. It makes sense to state that a nation with a high SFAF is a nation where the KA102 funds are producing a high impact, higher than those nations with a lower SFAF.

Example: **¡Error! No se encuentra el origen de la referencia.** shows the RME values for all the German regions in 2014.

Table 2. Germany - Erasmus+ VET Regional data 2014

GERMANY 2014	Budget	% €	Students	% of all students	RME
<b>Baden Württemberg</b>	<b>2930048</b>	<b>9%</b>	<b>598753</b>	<b>15,50%</b>	<b>57%</b>
<b>Bayern</b>	<b>5038164</b>	<b>15%</b>	<b>615672</b>	<b>15,94%</b>	<b>96%</b>
Berlin	4234163	13%	128579	3,33%	385%
<b>Brandenburg</b>	<b>744069</b>	<b>2%</b>	<b>70313</b>	<b>1,82%</b>	<b>124%</b>
Bremen	139997	0%	40405	1,05%	41%
Hamburg	1487212	5%	86538	2,24%	201%
<b>Hessen</b>	<b>1745261</b>	<b>5%</b>	<b>287652</b>	<b>7,45%</b>	<b>71%</b>
<b>Mecklenburg-Vorpommern</b>	<b>244831</b>	<b>1%</b>	<b>53136</b>	<b>1,38%</b>	<b>54%</b>
<b>Niedersachsen</b>	<b>4053705</b>	<b>12%</b>	<b>421219</b>	<b>10,90%</b>	<b>113%</b>
<b>Nordrhein-Westfalen</b>	<b>7452721</b>	<b>23%</b>	<b>894651</b>	<b>23,16%</b>	<b>97%</b>
Rheinland-Pfalz	283394	1%	192532	4,98%	17%
Saarland	70500	0%	52953	1,37%	16%
<b>Sachsen</b>	<b>770931</b>	<b>2%</b>	<b>147581</b>	<b>3,82%</b>	<b>61%</b>
Sachsen-Anhalt	1513174	5%	51410	1,33%	344%
<b>Schleswig-Holstein</b>	<b>1989378</b>	<b>6%</b>	<b>143968</b>	<b>3,73%</b>	<b>162%</b>
Thüringen	326624	1%	78283	2,03%	49%

Inserting the percentage of students from each of the regions with an RME between 50% and 200% in our equation

$$SFAF_{nation}(\%) = \sum_{50\% \leq RME_{region} \leq 200\%} 100 \cdot \frac{Students_{region}}{Students_{nation}}$$

$$= 15.50 + 15.94 + 1.82 + 7.45 + 1.38 + 10.9 + 23.16 + 3.82 + 3.73 = 83.68\%$$

it is possible to calculate that more than 4 out of 5 of the German VET students (SFAF=83.68%) could benefit from a fair access to funds in 2014.

## 1.4 NATIONAL EQUITY - NE

The Regional Mobility Efficiency – RME and the Students Fair Access to Funds – SFAF are indicators that offer a good perception of equity in the different regions and how they affect the students, but do not calculate an exact value of the national equity of a country. The example of a region with a lot of students and an RME near the 50% border can illustrate this situation. If the RME of the region is slightly above the 50% limit it will directly increase the national SFAF value and if it is slightly under 50% it will decrease the national SFAF value. Small variations of the RME can have big effects on the global national SFAF value.

The solution proposed is best approached using vector notation. Let us consider a nation with  $n$  regions, and vectors  $\vec{f} = (f_1, f_2, \dots, f_n)$  and  $\vec{p} = (p_1, p_2, \dots, p_n)$ , whose coordinates are, respectively, the funds and student population of each region. The total national funds are  $f_N = f_1 + f_2 + \dots + f_n$ , and the national student population is  $p_N = p_1 + p_2 + \dots + p_n$ . Maximum equity will be reached when funds and population are, in relative terms, equally distributed. In vector notation, this can be established as:

Theorem: The distribution of funds is fair if (and only if)  $\vec{f}$  and  $\vec{p}$  are parallel vectors.

Proof: Equity is achieved if, in each region, the ratio of funds per student equals the national average. Thus, a necessary and sufficient condition for equity is given by:

$$\frac{f_r}{p_r} = \frac{f_N}{p_N}$$

for each region  $1 \leq r \leq n$ . A simple transposition of terms yields:

$$\frac{f_r}{f_N} = \frac{p_r}{p_N}$$

and therefore,

$$\frac{\vec{f}}{f_N} - \frac{\vec{p}}{p_N} = \vec{0}$$

which means that the vectors  $\vec{f}$  and  $\vec{p}$  are proportional and, indeed, parallel. QED

The vector notation developed so far allows us to treat all the regions within a nation on an equal footing. For instance, following the previous theorem, inequity can be equaled to a deviation from parallelism between  $\vec{f}$  and  $\vec{p}$ . Recalling the proof of the theorem, it is logical to introduce the *inequity vector*  $\vec{\delta}$  as:

$$\vec{\delta} = \frac{\vec{f}}{f_N} - \frac{\vec{p}}{p_N}$$

We can now reformulate our previous result as:

Theorem: There is equity if, and only if,  $\vec{\delta} = \vec{0}$ .

Therefore, the more  $\vec{\delta}$  deviates from zero, the more inequity there is. For a given region, we can define the *regional inequity* as the corresponding component of the inequity vector:

$$\delta_r = \frac{f_r}{f_N} - \frac{p_r}{p_N}$$

This measure will be positive if the region receives more funds that correspond with its population, and negative otherwise, within the limits -1 and +1. At a global level, a measure of *national inequity* is given by the addition of the absolute values of the regional inequities:

$$\text{National Inequity} = \|\vec{\delta}\| = \sum_{r=1}^N |\delta_r|$$

Since the coordinates of  $\vec{\delta}$  can be positive or negative, and take values between -1 and 1, the values of  $\|\vec{\delta}\|$  range between 0 (absolute equity) and 2 (absolute inequity). In order to establish a unit based range, and for the sake of clarity, the national inequity will be rescaled as a percentage, maximum 100%, and **equity** will be measured instead of *inequity*:

$$\text{National Equity} = \left(1 - \frac{\|\vec{\delta}\|}{2}\right) \cdot 100 (\%)$$

Or, as a function of coordinates:

**EQUATION 3 NATIONAL EQUITY – NE**

$$\text{National Equity} = \left(1 - \frac{\sum_{r=1}^n |\delta_r|}{2}\right) \cdot 100 (\%)$$

This definition of National Equity has the advantage over the SFAF value that it provides an exact value that describes the fairness in the national distribution of funds that does not depend on having RMEs near the subjective limits [50%,200%]. The disadvantage is that it does not provide direct information on how many students are benefiting or not from the funds.

As both values, the National Equity and the SFAF indicator, offer complementary advantages, the present research uses both amounts to describe and analyse the fairness in the national distribution of funds. As the total inequity in a region  $\delta_r$  does not offer specific advantages other than being an intermediate step to calculate the National Equity – NE, only the Regional Mobility Efficiency – RME is taken into account in the Comparative Education Research to establish the conclusions about the different regions.

Example:

**Error! No se encuentra el origen de la referencia.** shows the regional inequity values for all the German regions in 2014.

GERMANY 2014	Budget	% €	Students	% of all students	Inequity $\delta_r$	Inequity  $ \delta_r $
Baden Württemberg	2930048	9%	598753	15%	-0,0662	0,0662 (7%)
Bayern	5038164	15%	615672	16%	-0,0068	0,0068 (1%)
Berlin	4234163	13%	128579	3%	0,0949	0,0949 (9%)
Brandenburg	744069	2%	70313	2%	0,0043	0,0043 (0%)
Bremen	139997	0%	40405	1%	-0,0062	0,0062 (1%)
Hamburg	1487212	5%	86538	2%	0,0226	0,0226 (2%)
Hessen	1745261	5%	287652	7%	-0,0216	0,0216 (2%)
Mecklenburg-Vorpommern	244831	1%	53136	1%	-0,0063	0,0063 (1%)
Niedersachsen	4053705	12%	421219	11%	0,0137	0,0137 (1%)
Nordrhein-Westfalen	7452721	23%	894651	23%	-0,0059	0,0059 (1%)
Rheinland-Pfalz	283394	1%	192532	5%	-0,0413	0,0413 (4%)
Saarland	70500	0%	52953	1%	-0,0116	0,0116 (1%)
Sachsen	770931	2%	147581	4%	-0,0149	0,0149 (1%)
Sachsen-Anhalt	1513174	5%	51410	1%	0,0325	0,0325 (3%)
Schleswig-Holstein	1989378	6%	143968	4%	0,0230	0,0230 (2%)
Thüringen	326624	1%	78283	2%	-0,0104	0,0104 (1%)

In 2014 in Germany there were  $p_N = 3,863,645$  students and the national funds received were  $f_N = 33.024.172$  €. In Baden Württemberg there were  $p_r = 598,753$  students and the region received  $f_r = 2,930,048$  €.

To measure the inequity, the next equation can be used:

$$\delta_{Baden\ Württemberg} = \frac{f_r}{f_N} - \frac{p_r}{p_N} = \frac{2,930,048\ \text{€}}{33,024,172\ \text{€}} - \frac{598,753}{3,863,645} = -0,0662 ,$$

in percentage, -7% (as mentioned in the results' table)

Taking into account the equation for the National Equity and adding up all the regional inequities mentioned in the above table:

$$\begin{aligned}
 \text{National Equity} &= \left(1 - \frac{\sum_{r=1}^n |\delta_r|}{2}\right) \cdot 100 (\%) = \\
 &\left(1 - \frac{0,0662 + 0,0068 + 0,0949 + 0,0043 + 0,0062 + 0,0226 + 0,0216 + 0,0063 + 0,0137 + 0,0059 + 0,0413 + 0,0116 + 0,0149 + 0,0325 + 0,0230 + 0,0104}{2}\right) \\
 &\quad \cdot 100(\%) \\
 &= \left(1 - \frac{0,3822}{2}\right) \cdot 100(\%) = 80,89\%
 \end{aligned}$$

The German KA102 National Equity in 2014 was NE= 80.89%

## 2. MONITORING ERASMUS+: EXAMPLE VET KA102

### 2.1 RESEARCHING BOUNDARIES

The present research demonstrates with the example of KA102 how these mathematical tools can provide useful information about the Erasmus+ funding procedure. It is focused on the initial Vocational Education and Training offered in schools or in combination with work based learning to young students between 15 and 19 years old to achieve official qualifications and certificates in France, Germany, Italy, Spain and the United Kingdom. Higher Education in the mentioned countries is heterogeneous and it is difficult to separate the impact of the funds in VET institutions from the influence they also have on the traditional university courses, hence this study does not calculate how funds are being distributed in Higher Education institutions.

VET and VET mobilities are subjects that are not frequently studied and, thus, there is not much previous information that can be used as a documentation background. Early school leaving, unemployment in general, and youth unemployment in particular are common problems throughout Europe. For a citizen to get and maintain a job he/she has to provide a professional qualification attainable through a proper education and training. In the case of the present research, the focus is set on students of between 15 and 19 years old attending upper secondary vocational education and training. Each of the studied countries has different initial Vocational Education and Training - iVET courses at this study level that are offered in combination or as an alternative to upper secondary general education.

The Erasmus+ programme intends to improve education, as a general objective, and has also the specific aim of reducing youth unemployment. To choose the countries, part of this study the results of the previous mobility programme, “Leonardo”, were taken into account:

Germany, the United Kingdom and Spain were the top three destination countries for individuals taking a Leonardo training programme in 2007-2011, attracting between them 45 % of all participants. Most participants came from Germany, France and Italy. (EUROPEAN COMMISSION, 2012, p. 10).

France, Germany, Italy, Spain and the United Kingdom contain more than half of all the VET students in the European Union - EU, 54% in 2012, (THE WORLD BANK, 2016). The present research describes how are Erasmus+ funds being distributed to foster mobilities in VET in France, Germany, Italy, Spain and the United Kingdom.

## 2.2 STUDENTS

The traditional official data sources do not provide in-depth information about the amount of VET students in the world. Busemeyer and Schlicht-Schmälze point out the problems with UNESCO and OECD information:

The UNESCO data does not distinguish between school- and workplace-based VET systems and countries with extensive school-based VET, like France, are grouped with dual system countries like Germany.

Recent data from OECD data include information on the share of students in combined school- and apprenticeships. Another problem is that initial VET is sometimes treated as upper-secondary, sometimes as post-secondary or even as lower-secondary education, which leads to misclassifications and biases (Busemeyer & Schlicht-Schmälze, 2014).

Eurostat also offers data, but, at the moment of the study, it did not offer information for all of the studied countries. In all of these sources, UNESCO, OECD and Eurostat, the information was offered for the different countries at a national level, but they did not provide detailed data at the regional level. To find the amount of students in each region, official statistics institutions in each country had to be used.

The information of the amount of full-time iVET students in each region was provided:

- In France, by Centre d'études et de recherches sur les qualifications (CÉREQ, 2014)
- In Germany, by Statistik Portal (STATISTIK-PORTAL, 2015)
- In Italy, by ISTAT (ISTAT, 2013)
- In Spain, by Ministerio de Educación, Cultura y Deporte (MECD, 2015)
- In the United Kingdom – UK, by the UK Government for England (UK GOVERNMENT, 2012 E), Northern Ireland (UK GOVERNMENT, 2012 NI) and Wales (UK GOVERNMENT, 2014) and by the Scottish Government (SCOTTISH GOVERNMENT, 2013), in Scotland.

Each of these information sources has different rules to count their iVET students that depend on how are their VET systems. For example, in the United Kingdom, there is a large amount of students that attend courses on a part-time basis. Statistics in the United Kingdom offer a conversion rate that establishes a relation between the part-time students and the amount of full-time students they would represent. All the calculations and conclusions made in this research are made with nationally weighted values and national percentages to facilitate the comparison between the research areas. This means that the specific absolute amount of students is never used as a measurement tool. The Regional Mobility Efficiency – RME and the National Equity are weighted equations and the Students Fair Access to Funds – SFAF is a percentage value.

## 2.3 REGIONS

This research intends to provide information on how do the Erasmus+ funds reach the different regions in the European Union. The regions used in the present research are based on the Nomenclature of Territorial Units for Statistics (NUTS), drawn up by Eurostat over 30 years ago in order to provide a breakdown of the economic territory of the European Union into territorial units for the production of regional statistics and for targeting political interventions at a regional level (EUROSTAT, 2015).

The NUTS serves several objectives:

- It ensures harmonised standards in the collection and transmission of regional data;
- It guarantees that published regional statistics are based on comparable data;
- It enables the analysis and comparison of the socioeconomic situation of the regions based on harmonised data;
- Policy interventions such as the European Structural Funds can be specifically targeted to support disadvantaged and less competitive regions (EUROSTAT, 2015).

The regions used in the present research are the biggest available NUTS regions in each country that have an autonomous influence over their education policies. In the case of France, Spain and Italy the regions used are at level NUTS 2. In the case of Germany and the United Kingdom the regions are at level NUTS 1. France rearranged their regions in January 2016. In this research this change has not been considered.

Table 4. Research regions

France	Germany	Italy	Spain	United Kingdom
Alsace	Baden Württemberg	Abruzzo	Andalucía	East Midlands
Aquitaine	Bayern	Basilicata	Aragón	East of England
Auvergne	Berlin	Calabria	Canarias	London
Basse- Normandie	Brandenburg	Campania	Cantabria	North East
Bourgogne	Bremen	Emilia-Romagna	Castilla y León	North West
Bretagne	Hamburg	Friuli-Venezia Giulia	Castilla-La Mancha	Northern Ireland
Centre	Hessen	Lazio	Cataluña	Scotland
Champagne- Ardenne	Mecklenburg- Vorpommern	Liguria	Ciudad Autónoma de Ceuta	South East
Corse	Niedersachsen	Lombardia	Ciudad Autónoma de Melilla	South West
Franche-Comté	Nordrhein- Westfalen	Marche	Comunidad de Madrid	Wales

Haute-Normandie	Rheinland-Pfalz	Molise	Comunidad Foral de Navarra	West Midlands
Île-de-France	Saarland	Piemonte	Comunidad Valenciana	Yorkshire and the Humber
Languedoc-Roussillon	Sachsen	Puglia	Extremadura	
Limousin	Sachsen-Anhalt	Sardegna	Galicia	
Lorraine	Schleswig-Holstein	Sicilia	Illes Balears	
Midi-Pyrénées	Thüringen	Toscana	La Rioja	
Nord-Pas-de-Calais		Trentino Alto Adige / Südtirol	País Vasco	
Outre-Mer		Umbria	Principado de Asturias	
Pays de la Loire		Valle d'Aosta / Vallée d'Aoste	Región de Murcia	
Picardie		Veneto		
Poitou-Charentes				
Provence-Alpes-Côte d'Azur				
Rhône-Alpes				

Source: Created by the author with information from (EUROSTAT, 2015).

In the case of France, the NUTS 2 regions Guadeloupe, Martinique, Guyane, La Réunion and Mayotte have been considered together in the region as part of the NUTS 1 region Outre-Mer. The Provincia Autonoma di Bolzano/Bozen and the Provincia Autonoma di Trento make up the region Trentino Alto Adige/Südtirol.

#### 2.4. ERASMUS+ KEY INDICATORS: EXAMPLE VET KA102

During the period 2014/2016 Germany was the country that more projects funded, 1427, followed by France, 822, Spain, 819 and, at a distance, the United Kingdom, 311 and Italy 270 (see lect the first financing round.

Table ). These projects were awarded to 823 different institutions in Germany, 552 in France, 504 in Spain, 219 in Italy and 211 in the United Kingdom (see lect the first financing round.

Table ). A high amount of projects and institutions can involve a heterogeneous distribution of the funds and the capacity of reaching more funding spots. Germany scores high in these indicators and the United Kingdom and Italy low. Each of these institutions received an average of 1.73 projects per institution in Germany, 1.63 in Spain, 1.49 in France, 1.47 in the United Kingdom and 1.23 in Italy. If the average projects per institution is high, it means that the institutions of the mentioned country have been able to repeat their projects in different years providing their VET sector a stable financing background to accomplish mid-term objectives (see lect the first financing round.

Table 7).

The same principle is highlighted by the percentage of institutions that have always received funds. 21% of all the German institutions received funds in all the three years from 2014 to 2016, followed by 17% of the institutions in Spain, 11% in France and the United Kingdom and only 3% in the case of Italy (see lect the first financing round).

Table ). Thus, Germany and Spain are the countries that offer more stability to the funded institutions, Italy the least. The average project size was, in the case of Italy, the far biggest with 286,702 €, followed at a distance by the United Kingdom, 155,415 € and France, 100,211 €. The smallest average projects were found in Spain, 75,572 € and Germany, 71,532 € (see 5).

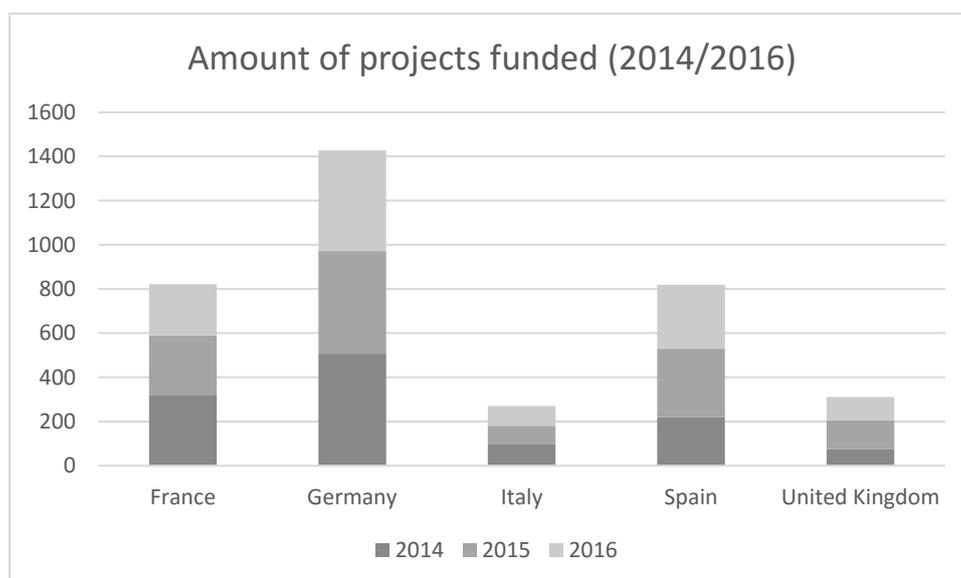
Table 5. Monitoring Erasmus+ VET – Average Key Indicators 2014/2016

	France	German y	Italy	Spain	UK
National Budget (€)	27,306,4	33,922,7	25,650,3	20,046,2	16,285,9
	14	29	24	44	65
<b>Number of projects</b>	<b>274</b>	<b>476</b>	<b>90</b>	<b>273</b>	<b>104</b>
Biggest Project (€)	1,772,22	1,147,04		1,204,46	
	6	7	911,309	9	774,547
Smallest Project (€)	4,366	2,243	21,352	2,914	4,799
Average Project (€)	100,211	71,532	286,702	75,572	155,415
Projects / Region	11.91	29.73	4.50	14.37	8.64
€/ Region	1,187,23	2,120,17	1,282,51	1,055,06	1,357,16
	5	1	6	5	4
Amount of projects that represent 20% of the budget	4.33	13.33	8.33	6.00	5.33
... percentage of nations total	2%	3%	9%	2%	5%
Amount of projects that represent 50% of the budget	22.0	80.0	25.7	30.3	16.7
... percentage of nations total	8%	17%	29%	11%	16%
Most frequent size, in % of national budget	0.1%	0.1%	1.2%	0.1%	0.4%
amount of frequent size projects	117.67	187.67	7.33	87.00	18.33
amount of frequent size projects, % over total	42%	39%	8%	27%	18%
... and represent % of the total budget	12%	19%	16%	9%	6%
Students in regions with more than the national average budget	46.32%	27.43%	37.54%	42.94%	53.93%
Students in regions with less than the national average budget	53.68%	72.57%	62.46%	57.06%	46.07%

Students in regions with more than double the national average budget	8.15%	6.45%	11.29%	4.63%	4.47%
Students in regions with less than half the national average budget	34.89%	8.51%	40.64%	7.67%	23.98%
Students in regions with no access to funds	1.91%	0.00%	4.07%	0.50%	0.00%
<b>Students with a Fair Access to Funds – SFAF</b>	<b>56.96%</b>	<b>85.03%</b>	<b>48.08%</b>	<b>87.70%</b>	<b>71.56%</b>
<b>National equity</b>	<b>72.16%</b>	<b>82.08%</b>	<b>65.86%</b>	<b>81.25%</b>	<b>77.37%</b>
Regions	23	16	20	19	12
Regions with biggest project greater than 30%	15.67	6.33	10.67	10.33	7.67
... percentage of nations total	68%	40%	53%	54%	64%
Regions with biggest project greater than 50%	7.67	2.67	7.00	5.33	2.33
... percentage of nations total	33%	17%	35%	28%	19%
<b>Institutions that have always received funds (2014/16)</b>	<b>11%</b>	<b>21%</b>	<b>3%</b>	<b>17%</b>	<b>11%</b>
<b>Average projects per institution (2014/16)</b>	<b>1.49</b>	<b>1.73</b>	<b>1.23</b>	<b>1.63</b>	<b>1.47</b>

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

Figure 1. Amount of VET KA1 Erasmus+ projects funded (2014/2016)



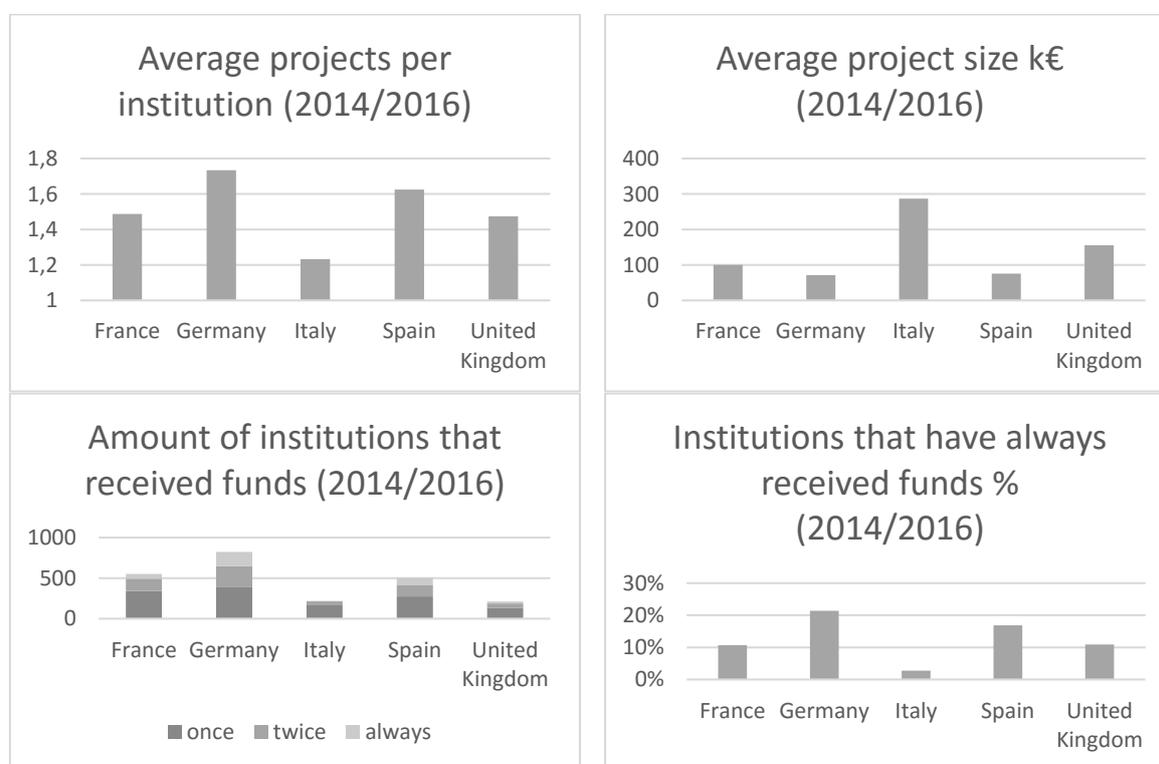
Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

Table 6. Amount of VET KA1 Erasmus+ projects funded (2014/2016)

	France	Germany	Italy	Spain	United Kingdom
2014	317	507	99	220	76
2015	273	464	82	309	130
2016	232	456	89	290	105
Total	822	1427	270	819	311

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

Figure 2. Amount of funded institutions (2014/2016)



Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

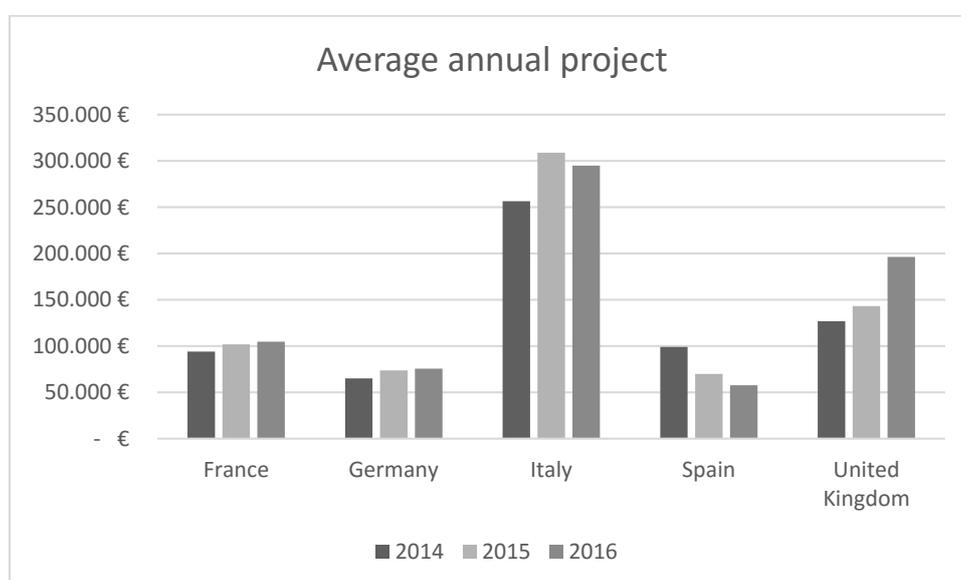
Table 7. Amount of funded institutions (2014/2016)

	France	Germany	Italy	Spain	UK
<b>Average projects per institution (2014/2016)</b>	<b>1.49</b>	<b>1.73</b>	<b>1.23</b>	<b>1.63</b>	<b>1.47</b>
Average project size (2014/2016)	100,211 €	71,532 €	286,702 €	75,572 €	155,415 €
<b>Institutions that have received funds (2014/2016)</b>	<b>552</b>	<b>823</b>	<b>219</b>	<b>504</b>	<b>211</b>
... once	341	395	174	274	134

... twice	153	252	39	145	54
... always	58	176	6	85	23
... once (%)	62%	48%	79%	54%	64%
... twice (%)	28%	31%	18%	29%	26%
... always (%)	11%	21%	3%	17%	11%

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

Figure 3 Average annual project size



Source: Compiled by the author

Table 8. Average annual project size

	France	Germany	Italy	Spain	United Kingdom
2014	94,090 €	65,136 €	256,370 €	99,105 €	126,824 €
2015	101,829 €	73,812 €	308,893 €	69,922 €	143,198 €
2016	104,713 €	75,648 €	294,844 €	57,689 €	196,225 €
Period average	100,211 €	71,532 €	286,702 €	75,572 €	155,415 €

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

## 2.5 REGIONAL MOBILITY EFFICIENCY – RME: EXAMPLE VET KA102

The region of Molise in Italy is the region with the highest Regional Mobility Efficiency – RME, 542%, the region with highest average Erasmus+ VET (KA102/116) funds per student in the target countries (see

Table ).

There are 12 regions in France, Germany, Italy, Spain and the United Kingdom with an average RME higher than 200%, the value that indicates the region receives more than double the national average. 5 of these regions are Italian (Molise, 542%, Umbria, 331%, Toscana, 275%, Basilicata, 234%, Marche, 229%), 3 of them German (Berlin, 368%, Sachsen-Anhalt, 241%, Hamburg, 219%), 2 are French (Auvergne, 241%, Île-de-France, 213%). Spain (Galicia, 237%) and the United Kingdom (Northern Ireland, 214%) where each have a region among this group (see

Table ).

There are 25 regions with an average RME lower than 50%, the value that indicates the region receives less than half the national average. 9 of these regions are Italian (Sardegna, 47%, Sicilia, 45%, Lombardia, 33%, Trentino Alto Adige / Südtirol, 31%, Puglia, 22%, Liguria, 0%, Valle d'Aosta / Vallée d'Aoste, 0%) and 12 of them are in France (Outre-Mer, 49%, Bourgogne, 49%, Poitou-Charentes, 38%, Languedoc-Roussillon, 35%, Nord-Pas-de-Calais, 32%, Limousin, 26%, Franche-Comté, 21%, Picardie, 15%, Alsace, 6%, Centre, 4%, Basse-Normandie, 2%, Corse, 0%). In Germany there are 3 of these regions (Thüringen, 49%, Rheinland-Pfalz, 23%, Saarland, 13%) and the United Kingdom has 2 of them (South East 37%, East of England, 11%). Spain has one region in this group (Cantabria, 10%) (see

Table ).

Of these 25 regions, Corse in France received funds only once and Liguria and Valle d'Aosta / Vallée d'Aoste in Italy have never received funds during the 2014/2016 period (see

Table ).

Table 9. Regional Mobility Efficiency RME 2014/2016

Rank	Country	EU Region	Average
1	Italy	Molise	542%
2	Germany	Berlin	368%
3	Italy	Umbria	331%
4	Italy	Toscana	275%
5	Germany	Sachsen-Anhalt	241%
6	France	Auvergne	241%
7	Spain	Galicia	237%
8	Italy	Basilicata	234%
9	Italy	Marche	229%
10	Germany	Hamburg	219%
11	United Kingdom	Northern Ireland	214%
12	France	Île-de-France	213%
13	Spain	Comunidad Foral de Navarra	187%

14	Italy	Friuli-Venezia Giulia	180%
15	France	Aquitaine	172%
16	France	Champagne-Ardenne	160%
17	United Kingdom	Yorkshire and the Humber	159%
18	France	Pays de la Loire	159%
19	United Kingdom	London	154%
20	Italy	Emilia-Romagna	153%
21	France	Midi-Pyrénées	151%
22	Germany	Schleswig-Holstein	150%
23	Spain	País Vasco	142%
24	Germany	Brandenburg	140%
25	Italy	Veneto	137%
26	Spain	Ciudad Autónoma de Melilla	134%
27	United Kingdom	North West	126%
28	Spain	Comunidad de Madrid	125%
29	Spain	Principado de Asturias	124%
30	Italy	Calabria	123%
31	Spain	Andalucía	116%
32	United Kingdom	Scotland	116%
33	Germany	Niedersachsen	113%
34	United Kingdom	West Midlands	111%
35	United Kingdom	East Midlands	108%
36	France	Rhône-Alpes	108%
37	Spain	Canarias	103%
38	Germany	Nordrhein-Westfalen	99%
39	United Kingdom	Wales	97%
40	Italy	Campania	97%
41	Germany	Bayern	96%
42	United Kingdom	South West	94%
43	Spain	Illes Balears	92%
44	France	Bretagne	91%
45	Italy	Abruzzo	90%
46	Italy	Piemonte	89%
47	Spain	Comunidad Valenciana	85%
48	Spain	La Rioja	82%
49	Spain	Extremadura	81%
50	Spain	Ciudad Autónoma de Ceuta	77%
51	France	Haute-Normandie	77%
52	Germany	Sachsen	75%
53	Germany	Bremen	74%
54	Germany	Hessen	71%
55	France	Lorraine	69%
56	France	Provence-Alpes-Côte d'Azur	67%
57	Spain	Castilla-La Mancha	65%
58	Italy	Lazio	64%
59	Spain	Castilla y León	61%
60	Germany	Baden Württemberg	59%
61	Spain	Cataluña	59%
62	Spain	Aragón	57%

63	United Kingdom	North East	55%
64	Germany	Mecklenburg-Vorpommern	51%
65	Spain	Región de Murcia	51%
66	France	Outre-Mer	49%
67	Germany	Thüringen	49%
68	France	Bourgogne	49%
69	Italy	Sardegna	47%
70	Italy	Sicilia	45%
71	France	Poitou-Charentes	38%
72	United Kingdom	South East	37%
73	France	Languedoc-Roussillon	35%
74	Italy	Lombardia	33%
75	France	Nord-Pas-de-Calais	32%
76	Italy	Trentino Alto Adige / Südtirol	31%
77	France	Limousin	26%
78	Germany	Rheinland-Pfalz	23%
79	Italy	Puglia	22%
80	France	Franche-Comté	21%
81	France	Picardie	15%
82	Germany	Saarland	13%
83	United Kingdom	East of England	11%
84	Spain	Cantabria	10%
85	France	Alsace	6%
86	France	Centre	4%
87	France	Basse-Normandie	2%
88	France	Corse	0%
89	Italy	Liguria	0%
90	Italy	Valle d'Aosta / Vallée d'Aoste	0%

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

## 2.6. STUDENTS WITH A FAIR ACCESS TO FUNDS – SFAF: EXAMPLE VET KA102

The present project considers that a region offers their students a fair access to funds if its RME is bigger than 50% and lower than 200%. In other words, a student has a fair access to funds if he/she studies in a region receiving between half and double the national funds per student average.

The total amount of students that are located in “fair” regions ( $50\% < \text{RME} < 200\%$ ) are the national quantity of students that have a fair access to funds. The national Students with a Fair Access to Funds-SFAF value is the percentage from all the country’s VET students that are located in “fair” regions.

Spain (83% in 2014, 92% in 2015, 89% in 2016) and Germany (84% in 2014, 87% in 2015, 85% in 2016), had the highest SFAF average values, Spain 88% and Germany 85%, of the three years period (see lect the first financing round).

Table 10).

United Kingdom started with a SFAF of 54% in 2014 and increased to 75% in 2015 and 85% in 2016. Its SFAF average was 72% (see lect the first financing round.

Table 10).

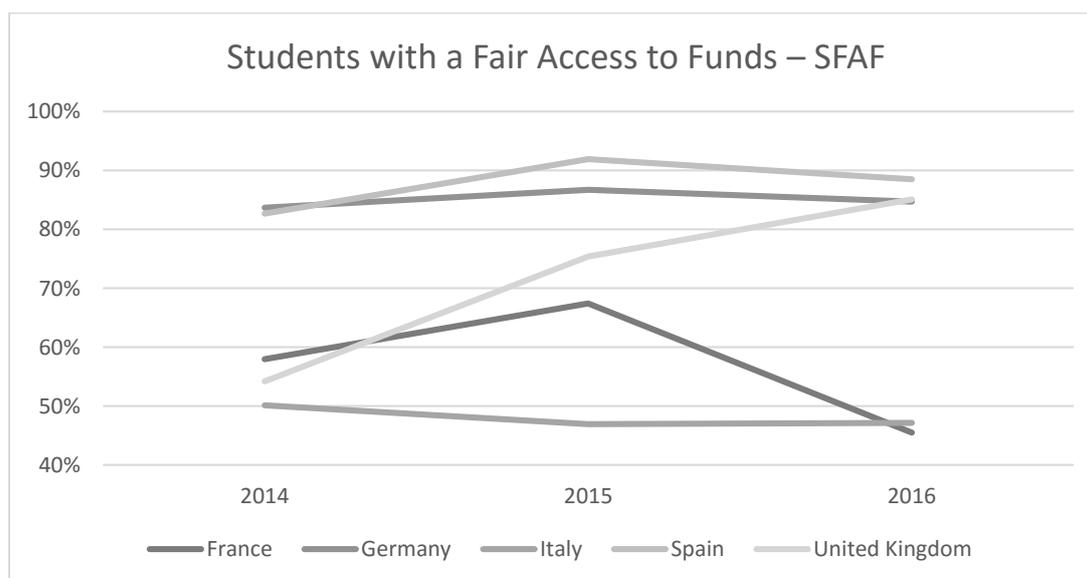
France (58% in 2014, 67% in 2015, 46% in 2016) and Italy (50% in 2014, 47% in 2015, 47% in 2016) show the lowest SFAF values of the group. In both cases, France and Italy had less than half of the students (France 46%, Italy 47%) with a fair access to funds in 2016 and a total average during the period of 57%, France and 48%, Italy (see lect the first financing round.

Table 10).

Considering the SFAF values it is possible to mention three groups of countries:

- Spain and Germany, with more than 4 out of 5 students with good funding opportunities
- United Kingdom, starting low, but catching up
- France and Italy, where only around half of their students have a fair access to funds

Figure 4. Students with a Fair Access to Funds - SFAF (2014/2016)



Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

Table 10. Students with a Fair Access to Funds - SFAF (2014/2016)

	France	Germany	Italy	Spain	United Kingdom
2014	58%	84%	50%	83%	54%
2015	67%	87%	47%	92%	75%
2016	46%	85%	47%	89%	85%
Average	57%	85%	48%	88%	72%

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

## 2.7 NATIONAL EQUITY – NE: EXAMPLE VET KA102

The National Equity – NE indicates the total mathematical equity of the funding process in a nation. A value of NE=100% means the country would be equally offering the Erasmus+ VET funds to all the students of the different regions.

Germany has an average NE of 82% (81% in 2014 and 2015, 84% in 2016) and Spain an average NE of 81% (80% in 2014, 83% in 2015, 81% in 2016). These are the two countries that perform best in this indicator (see lect the first financing round.

Table 3).

The United Kingdom increased its NE from a low 70% in 2014 to 80% in 2015 and 82% in 2016 and made an average of 77%, reaching the performance of Germany and Spain in 2016 (see lect the first financing round.

Table 3).

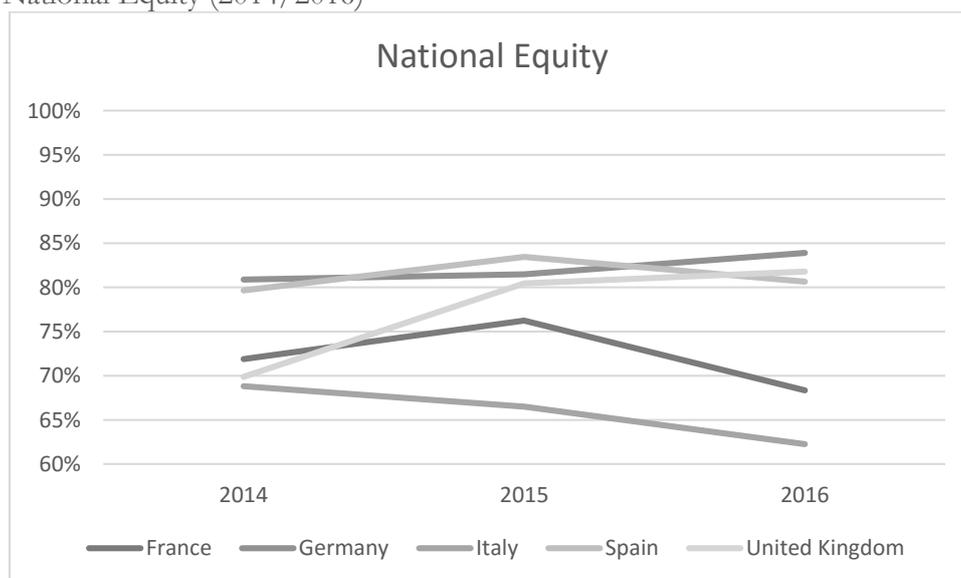
France with an average NE of 72% (72% in 2014, 76% in 2015, 68% in 2016) and Italy with an average NE of 66% (69% in 2014, 67% in 2015, 62% in 2016) scored lowest in this indicator (see lect the first financing round.

Table 3).

Taking into account the National Equity values it is possible to mention three groups of countries:

- Germany and Spain, always funding with equity
- United Kingdom, starting low, but improving
- France and Italy, always funding poorly

Figure 5. National Equity (2014/2016)



Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

Table 3. National Equity (2014/2016)

	France	Germany	Italy	Spain	United Kingdom
2014	72%	81%	69%	80%	70%
2015	76%	81%	67%	83%	80%
2016	68%	84%	62%	81%	82%
Average	72%	82%	66%	81%	77%

Source: Compiled by the author. In the case of 2016, the values for Spain reflect the first financing round.

## 2.8. RESULTS OF THE VET KA102 RESEARCH

This research analyses the VET mobility in France, Germany, Italy, Spain and the United Kingdom during the period 2014-2016 using the Erasmus+ mathematical tools:

- Erasmus+ Key Indicators
- Regional Mobility Efficiency – RME
- Students Fair Access to funds – SFAF
- National Equity - NE

The Erasmus + Key Indicators offer a general perspective on how the funds have been distributed and communicate similarities and differences in the funding procedures in the studied nations. Analysing the distribution of Erasmus+ VET mobility funds during the period 2014/2016 Germany was the country that more projects funded, 1427, followed by France, 822, Spain, 819 and, at a distance, the United Kingdom, 311 and Italy 270. These projects were awarded to 823 different institutions in Germany, 552 in France, 504 in Spain, 219 in Italy and 211 in the United Kingdom.

Germany was the country with the highest average of projects per institution and the highest average percentage of institutions that received funds always. The smallest average projects were found in Spain and Germany. The biggest average project size was located in Italy, followed at a distance by the United Kingdom and France.

The Regional Mobility Efficiency – RME, the Students Fair Access to funds – SFAF and the National Equity offer three points of view that focus on the three types of focus groups that are interested in optimising their funding actions: the regions, the students and the nation

Table 4. Regional, Students' and National 2014/2016 Average values

	Region - RME (min)	Region - RME (max)	Students - SFAF	Nation - NE
France	9%	194%	57%	72%
Germany	13%	368%	85%	82%
Italy	0%	551%	52%	65%
Spain	10%	237%	88%	81%
United Kingdom	11%	214%	72%	77%

### Regional perspective

Five out of twelve of the regions with the highest Regional Mobility Efficiency- RMEs were Italian, including the highest of all, Molise.

France has one and Italy two regions, with an RME close to 0%. Corse in France received funds only once during the three years and the two Italian regions of Liguria and Valle d'Aosta / Vallée d'Aoste never received funds during the analysed period.

### Student's perspective

The highest average Students with a Fair Access to Funds - SFAF values correspond to Spain, 88% and Germany, 85%. These were the countries with more students receiving between half and double the national funds per student average.

The United Kingdom started low, but caught up in 2016.

France and Italy show the lowest SFAF values of the group. In both cases, France and Italy had less than half of the students (France 46%, Italy 47%) with a fair access to funds in 2016 and a total average during the period of 57%, France and 48%, Italy.

### National perspective

The National Equity of Germany and Spain have been the highest during the whole analysed period (on average Germany NE=82%, Spain NE=81%) followed by the United Kingdom (on average NE=77%).

France and, specially, Italy had always the worst National Equity values (on average France NE=72%, Italy NE=66%)

## CONCLUSION

The RME, the SFAF and NE values could be used to analyse the regional, individual (students) and national performance of all the mobility programmes of the Key Action 1:

- Mobility project for higher education students and staff
- Mobility project for VET learners and staff
- Mobility project for school education staff
- Mobility project for adult education staff
- Mobility project for young people and youth workers

These are powerful tools that can track the trends of the social impact of the Erasmus+.

The current research project has created the Regional Mobility Efficiency - RME value to analyse the VET mobility projects in the regions and nations of France, Germany, Italy, Spain and the United Kingdom. The RME index gives each region the information on how they are performing in comparison with the other regions of their nation. The national Erasmus+ Agencies can use the RME index to discover regions that are performing best and use their best practices to help the regions that are performing worse in their RME index.

The Students with a Fair Access to Funds - SFAF offers a direct picture of how many students are benefiting from the Erasmus+ programme and can help to compare the performance of the funding procedures in the different countries. The National Equity values indicate the overall national Erasmus+ funding performance in terms of equity. This indicator can be used to calculate the equity of the funding performance of all the nations participating in the Erasmus+ programme in all the projects' calls of the Key Action 1.

### **A European panel to monitor Erasmus+**

Using a unified database with the regional population of general education, adult education and VET students in every one of the countries participating in Erasmus+ it would be possible to calculate all the RMEs and thus the SFAF and National Equity for the Erasmus+ Europe.

A European panel with the regional RMEs and the SFAF and NE values of each nation could picture and monitor trends in terms of equity. The ideal would be that every nation and Europe as a whole could reach a SFAF and NE of 100% by the end of the Erasmus+ programme in 2020 in all the sub actions of Key Action 1.

This European panel could use the proposed Erasmus+ Key Indicators to get a broader insight of the evolution of the funding procedures (see Table 1. Monitoring Erasmus+. Key indicators).

The European Horizon 2020 focuses on the knowledge-based economy and aims to (EUROPEAN COMMISSION, 2010):

- Prepare 40% of the European population (30 – 34 years old) to hold a Higher Education qualification.
- Reduce early school-leaving to 10%
- Foster student mobility up to 20% in Higher Education and 6% in Initial Vocational Education and Training

Erasmus+ intends to demonstrate that it is better to invest at a European rather than at a national level and proposes to focus on the people, institutions and systems, creating transnational synergies. These aims are considered by the external evaluators at the moment of assigning the points to award the funds to the mobility projects. An application receives more points for relevance if it tackles youth employment. But there is not effective feedback depending on the project results: the institution does not have to return any funds if it did not manage an employment for its young students.

Are the Erasmus+ funds producing the Horizon 2020 outcomes?

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