INTERPRETING STATISTICAL INDICATORS FOR DIRECT COMPARATIVE ANALYSIS IN EDUCATIONAL TOURISM

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Abstract: *Statistical data regarding the size of indicators that describe institutions engaged in the field of educational tourism can offer a more detailed understanding of this tourism segment. Time series analyses conducted through regression theory, reveal patterns of growth and development, and simultaneously provide a foundation for direct comparative studies among such institutions across various European nations. Additionally, the study explores various viewpoints that may shed light on the observed differences.*

Key words*: economic Statistics, educational tourism, museum*

INTRODUCTION

Educational tourism is not a new element within the classifications of tourism types. The "Grand Tour" subject, historically associated with the travels across continental Europe by young English people accompanied by tutors for educational purposes, emerged in the 17th century [3,6]. However, the tradition of such travels can be traced back in time, with pilgrimages and associated religious journeys being an educational experience [**7**]. Nowadays, educational tourism is observed in entirely different forms. It has diversified, embracing patterns that meet the requirements of modern society. The large number of participants in educational exchange programs like Erasmus and Fullbright, and the academic necessities that involve travel for seminars, conferences, congresses, workshops, or study visits, are just a few examples showing that educational tourism is uniquely developing. Interactive scientific centers, institutions, and museums present another form of information exposure, being a driving element of this type of tourism. Not only the younger generation but also visitors of all ages have the opportunity to engage in active learning processes. Everyone is offered the chance to discover information through direct experiences and, importantly, through practical involvement. The constructive and enjoyable use of leisure time, the unique and interactive approach to presenting information, and the fusion of academic learning with scientific adventure have made these institutions top educational destinations. Educational tourism thus offers multiple benefits to its participants, both personally and professionally. It's not just the accumulation of knowledge and skills that is beneficial. Global understanding and the development of intercultural competencies are essential educational requirements in the formation of human capital in our century. In the context of globalization and a competitive job market, educational tourism can contribute significantly to the development of these valuable skills[2,9].

Despite numerous analyses in the field provided by the literature, the real educational opportunities of educational tourism in its current form and its potential as an educational phenomenon have not been fully studied. Thus, the scientific approach is not yet fully realized and can constitute a continuous subject of study on this dynamic topic. The difficulty may be due to its particular nature. There are no theoretical foundations for translating all educational activities in tourism into a model that represents all engaged individuals or is universally applicable. Also, due to the large number of types of tourist activities, the directions of education in the context of each activity have not been identified. Even though this endeavor is difficult and possibly impossible to fully achieve, we consider that an increasingly important range of tourist activities can be reciprocally

correlated with educational directions. Moreover, individual expectations regarding tourism are very diverse, under the effect of psychological and pedagogical mechanisms that are insufficiently understood. Therefore, there is a need for an educational consensus regarding alternative methods applied **[**21**]**. It is understandable, then, that the impact of tourism manifests in a particular way on the individual, making it difficult to comprehend or measure. The purpose of this paper is to describe and track the statistical data regarding the number of visitors to European museum attractions, specifically the statistical summary and regression curves describing their evolution in the period 2013-2022.

MATERIALS AND METHODS

The statistical data used in this study are indicated by Eurostat for observations regarding educational levels **[**13**]**. The data on the total number of visitors, the number of foreign visitors, or the number of visitors under 16 years are those indicated by the Science Museum London, Science and Industry Museum Manchester, National Railway Museum York – from the Science Museum Group [19,20], Deutches Museum Bonn, Verkehrszentrum Munchen [8], and MUSE [15,16]. The statistical summary, graphic representations, and the calculation of regression functions were performed using Microsoft Excel.

RESEARCH RESULTS

Significant differences between certain regions in the European Union regarding educational levels have negative consequences on the economy as a whole and at the social level [4]. Data on this indicator places Romania in a lower-ranking area. Specifically, in 2016, countries such as Belgium, France, Sweden, the United Kingdom, and others had a graduation rate of over 40% for the population aged 30-34 years. In Romania, Italy, Croatia, this rate was only about 20%-30%, thus prompting member states to set objectives regarding the level of education of the population. In line with the Europe 2020 Strategy, the number of tertiary education graduates in the EU was expected to exceed 40% in this age category [12]. Following Eurostat data for the 30-34 age segment in 2022, Belgium exceeds 53%, France 49%, Germany 39%, UK (in 2019) 50%, Italy reaches over 27%, Croatia over 34%, and Romania 26.3% [13].

Regarding the level of education, this can provide explanations about consumer behavior **[**5]. A large number of people engaged in university mobility programs are found among the visitors of cultural institutions in their respective geographical areas. Cultural organizations, museums, and libraries are also on the list of eligible participating organizations according to the Erasmus+ methodology [10]. Furthermore, the promotion of learning centers and innovative spaces for this purpose, such as local learning centers, museums, and libraries, are themes found in the same program [11].

A study conducted on a sample of 600 individuals, of which 63% were aged between 21-24 years and 91% were undergraduate students, who participated in an Erasmus mobility program, reveals that approximately 61% of respondents found the experience to be spiritually valuable. The authors of the study indicated that the opportunity to visit new places is a primary benefit for participants in this program [1].

Table 1 contains a statistical summary consisting of minimum, maximum, average, and standard deviation values, as well as the median for the previously mentioned indicators from the Science Museum (UK), Science and Industry Museum (UK), and National Railway Museum (UK) for the period 2013-2015, 2020-2022, Deutches Museum Bonn (Germany) and Verkehrszentrum Munchen (Germany) for the period 2019-2022, and MUSE (Italy) for the period 2013-2022. The period analyzed was 2013-2022, depending on the availability of statistical data. The diagrams in figures 1-4 show the evolution of the

number of visitors and the estimated trend using the regression function and determination coefficients.

Table 1.

Statistical Summary of Visitor Numbers (x 1000) for the Science Museum Group, Deutches Museum, and MUSE

	Minimum	Maximum	Average	Std.dev.	Median
Science Museum_ number of visitors	208	3348	2341.16	1168.71	2877
Science Museum_number of visitors under 16 years old	79	1129	793.66	374.12	955.5
Science Museum_number of foreign visitors	4	1577	855.58	675.14	976
Science and Industry Museum_number of visitors	36	680	427.66	230.01	459.5
Science and Industry Museum_number of visitors under 16 years old	15	257	155.5	83.87	172
Science and Industry Museum_number of foreign visitors	0.4	120	50.31	42.20	45.5
National Railway Museum_number of visitors	89	926	577.66	261.55	631
National Railway Museum_number of visitors under 16 years old	25	236	152.16	67.13	169
National Railway Museum_number of foreign visitors	0.3	98	49.716	37.52	54
Deutches Museum Bonn_number of visitors	14.154	53.667	33.29	15.71	32.68
Verkehrszentrum Munchen_ number of visitors	6.247	136.593	81.21	50.21	91.00
MUSE_number of visitors	139.369	679.963	402.81	206.25	325.54

Source: Adapted from data provided by the Science Museum Group [19,20], Deutches Museum [8], and MUSE [15,16]

The fact that such institutions constitute destinations in educational tourism can be indicated by the interest of foreign visitors in these attractions. The proportion is high for the Science Museum, with foreign tourists representing approximately 36% of the total number of visitors. For the National Railway Museum and the Science and Industry Museum, the proportion of foreign visitors is lower, but still around 10%. Similarly, the percentage of young people under 16 exceeds 33% for both the Science Museum and the Science and Industry Museum. Although the average values and the median of the total number of visitors at MUSE are lower than those of similar indicators from the Science Museum group, the annual minimum value of the number of visitors remains high, even in the years 2020 - 2021, characterized by pandemic-related restrictions.

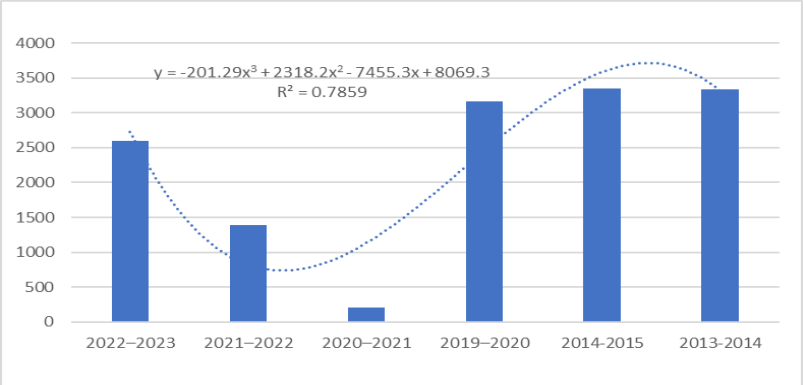

Figure 1. Evolution of Visitor Numbers (x1000) at the Science Museum
Source: Adapted from data provided by the Science Museum Group [19,20]

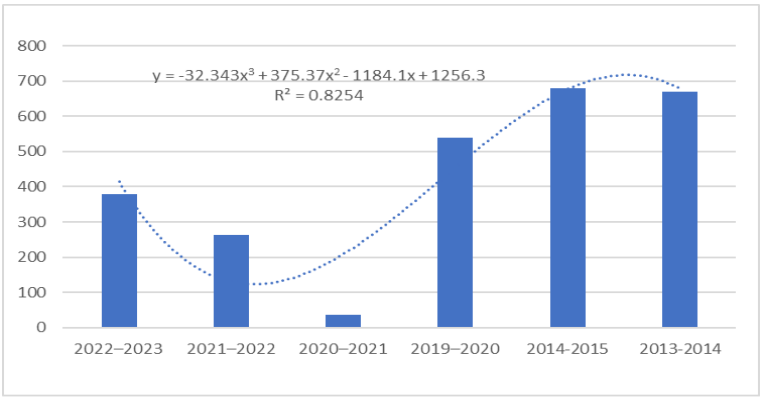

Figure 2. Evolution of Visitor Numbers (x1000) at the Science and Industry Museum
Source: Adapted from data provided by the Science Museum Group [19,20]

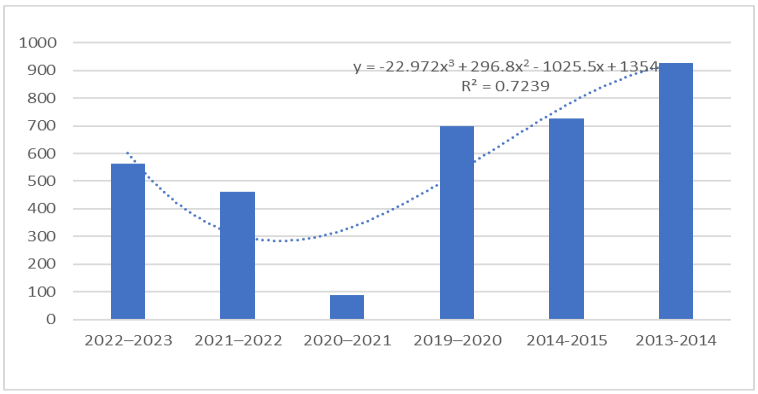

Figure 3. Evolution of Visitor Numbers (x1000) at the National Railway Museum
Source: Adapted from data provided by the Science Museum Group [19,20]

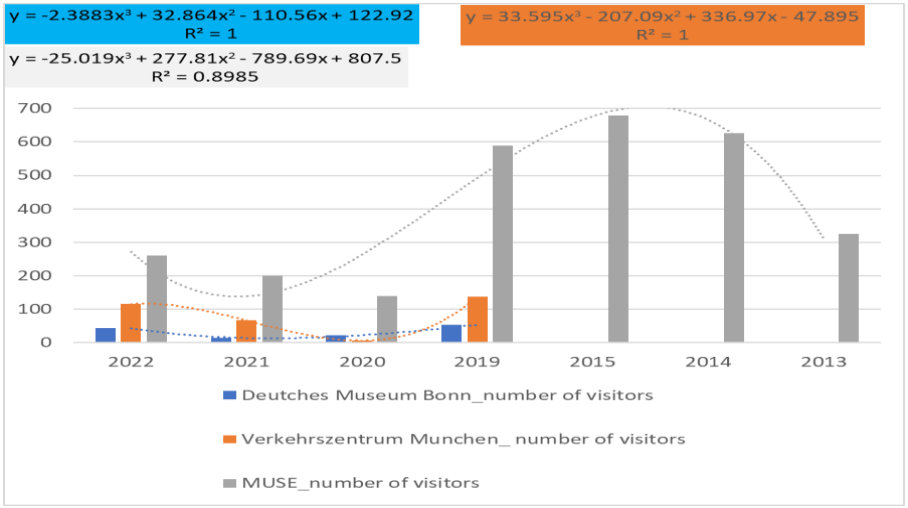

Figure 4. Evolution of Visitor Numbers (x1000) at Deutches Museum, Verkehrszentrum Munchen, MUSE
Source: Adapted from data provided by Deutches Museum [8], MUSE [15,16]

Following the regression functions determined based on the statistical data regarding the number of visitors, it is observed that the polynomial model used in each case,

$$y = ax^2 + bx + c$$

brings determination coefficients R^2 with high values, ranging between 0.7 and 1. This indicates a good fit of the chosen model in accordance with the statistical data. Furthermore, all the determined regression functions indicate a similar graphical evolution. The period before the COVID pandemic, namely 2014-2019, shows high visitor numbers, followed by a decline in 2020-2021, after which an increasing trend is again observed. This fact brings renewed hope that the tourism sector, heavily affected by pandemic restrictions, is evidently showing signs of recovery.

Educational activities in tourism are those professional activities aimed at achieving an educational purpose, namely the development of the individual. These concepts can be incorporated into the training of university students/graduates. Using/practicing tourism as a means of (self) education can be reciprocally correlated with understanding the theoretical foundations of educational activities in tourism. Knowledge of the principles of educational tourism, its goals, and content can lead to direct and rapid positive outcomes. There is also a need for a more detailed identification of the educational potential of tourism. Being an exponent of socio-cultural activity, it could ensure, within the framework of leisure time, the integrity of individual development. The moral and civic behavior of young people can also be formed and educated through various forms of educational tourism **[**17**]**. Young students could more effectively develop their ability to embrace social and human values, as well as ways of life. Some educational alternatives, even if not found in the school curriculum, can offer young people examples of good practices and the possibility to utilize acquired knowledge [18].

Therefore, new approaches in the development of educational methodology are currently required, aiming to define perspectives that allow us to understand the type of personality subjected to education. In this context, tourism can play a direct role, contributing to the formation of concrete qualities. Moreover, educational tourism can be the one that ensures the educational function of transmitting experiences acquired by previous generations to the following ones [14]. Thus, the need to reconsider attitudes towards individual education and to identify approaches that lead to the development of other categories of content and learning methods, probably currently less used in educational practice, is highlighted. Nonetheless, student-centered education is a concept that is increasingly encountered. Individual education, which involves direct knowledge by the individual, can be materialized through tourism. Tourism as an educational phenomenon finds its place in the social structures of society, having a socio-cultural function that allows the realization of educational goals and objectives. Tourism can be positioned at the base of such forms of educational interaction, being a permanent framework for the pedagogically healthy integration of personal potential. Personal development can also be achieved through tourism, constituting a genuine educational potential of society.

CONCLUSIONS

We consider the reciprocal link between the educational level and the interest of individuals in visiting cultural institutions to be evident. Specifically, the educational level contributes both directly and indirectly to increasing the visitation rate of such institutions. Conversely, frequent visits by a large number of young people to these institutions can open new horizons for them regarding the optimal choice of a future professional path that includes university studies.

The direct connections between the education of young people and the frequency of participants in various segments of educational tourism necessitate regular monitoring to understand the dimension of indicators such as the number of visitors, total or by age,

foreign or resident, of major museums in Europe, from countries that have successfully directed a high percentage of their youth towards university education.

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