Journal of Hospitality, Leisure, Sport & Tourism Education 15 (2014) 116–123

Contents lists available at ScienceDirect

Journal of Hospitality, Leisure, Sport & Tourism Education

journal homepage: www.elsevier.com/locate/jhlste

Practice Papers

Simulating seasonal concentration in tourism series

Antonio Fernández-Morales *

Departamento de Economía Aplicada (Estadística y Econometría, Dep. 68), University of Málaga, Calle El Ejido, 29071 Málaga, Spain

ARTICLE INFO

Keywords:
Seasonality
Simulation
Tourism

ABSTRACT

The aim of this paper is to describe the main features and use of an online interactive graphical simulator that has been developed for the study of tourism seasonality by means of the Gini index and the Lorenz curve. The simulator is embedded into a microsite known as the Seasonal Concentration Lab, which includes three versions of the simulator, a set of activities and references. The main results of a survey carried out at the end of the final semester indicate that our students find the activities useful for understanding the concepts, easy to use, and a 'less boring' way to learn. In addition, most students indicated that they would like more resources and activities like the Seasonal Concentration Lab to be included in their programmes of study, and have a certain preference for using them in laptops and mobile devices.

1. Introduction

A course in statistical methods is often included in undergraduate tourism degree programmes at Spanish universities, usually in the first academic year. The rationale for such courses is that they are generally considered to provide students a series of useful quantitative tools for their future professional activity. However, it is also very common that students enroled in these courses exhibit little motivation, and sometimes find it quite difficult to understand the concepts and techniques involved (Huang, Huang, & Smith, 2011).

To overcome this problem, which is also present in introductory statistics courses in other social sciences degrees, new learning approaches based on information and communication technologies (ICT) are becoming available. The approach followed in this paper is in line with that of authors who consider that the use of ICT-based tools and resources, either on-line or in blended learning schemes, are an effective way to improve students' understanding and interest, and thus enhance the quality of tourism education (Ali, Murphy, & Nadkarni, 2014; Vieira Vasconcelos, Balula, & Almeida, 2013; Hsu, 2012; Sigala, 2002, 2012). These tools and resources are used within the course as a means to illustrate, to investigate and even to simulate, and go further than a simple collection of static materials.

In the field of statistics in higher education, one of the most significant trends in recent years has been to develop interactive learning tools to aid students in understanding difficult concepts. Simulating and experimenting with data in an interactive manner is thought to be a more effective way to assimilate and understand complex and abstract concepts than using traditional methods in the classroom (Sosa, Berger, Saw, & Mary, 2011; González, Jover, Cobo, & Muñoz, 2010; Dinov, Christou, & Sanchez, 2008; Lunsford, Rowell, & Goodson-Espy, 2006). It is expected that these interactive electronic resources do the calculations in the background and show the visual results interactively, thus allowing students to focus on

* Tel.: +34 952137189.
E-mail address: afdez@uma.es

http://dx.doi.org/10.1016/j.jhlste.2014.08.001
1473-8376/

exploring and investigating simulated or real-life examples (Bolliger, & Supanakorn, 2011; Chance, Ben-Zvi, Garfield, & Medina, 2007), as well as in geovisualisation (Sigala, 2013).

Earlier attempts to develop learning tools of this kind in the 1990s included programs to be executed locally in desktops. Although these were easy-to-use tools for entering, manipulating and displaying data with graphical capabilities, they offered a limited degree of interactivity (Wang, Vaughn, & Liu, 2011). Later on, these learning tools were integrated into a more general Internet-oriented scheme using technologies like Java and Flash. A particularly well-accepted example in this field was the Java applet (Byrne, Heavey, & Byrne, 2010) embedded into web documents, which was designed as an interactive graphical resource for learning specific concepts, such as the central limit theorem (Dinov, Christou, & Sanchez, 2008), the confidence interval (West & Ogden, 1998), hypothesis testing (West & Ogden, 1998; Schneiter, 2008), and others. In general, it is widely recognised that these interactive electronic resources provide helpful support for learning statistics. According to Wang et al. (2011, p. 301), these interactive graphical resources give students the opportunity "to stop, rewind, restart…," thus requiring less cognitive load and improving comprehension. Since it is the computer that does the underlying calculations, the learner can focus on the concepts by exploring and simulating (Rieber, Tzeng, & Tribble, 2004).

Based on these well-known examples and on previous works by the author in the field of tourism studies (Fernández-Morales, 2000, 2001) and actuarial studies (Fernández-Morales, 2010, 2011), a graphical simulator was developed to study tourism seasonality using the Gini index and the Lorenz curve. In contrast to other interactive statistics learning resources intended for wide use in any area of the social sciences, this simulator was specifically designed for tourism students in an attempt to focus on the particular needs of these learners.

However, an interactive graphical tool is, in itself, insufficient to improve the learning process; it must be integrated into a coherent and efficient pedagogical strategy (delMas, Garfield, & Chance, 1999). Furthermore, according to Cairncross and Mannion (2001), "understanding occurs best through performing tasks." For these reasons, the graphical simulator is the core of the Seasonal Concentration Lab; a microsite that includes a complete guided programme comprising nine activities, a reference guide, and other information. The Seasonal Concentration Lab is currently used as a complementary resource in the blended strategy we follow at the University of Malaga, but its self-contained design allows it to be used in an e-learning scheme.

The aim of this paper is twofold. First, the main features and use of the Seasonal Concentration Lab and the interactive graphical simulator it contains is described. Second, an initial assessment is provided of the perceived usefulness and student satisfaction with these resources by means of a survey carried out at the end of the final semester. Finally, the paper concludes with a summary of the main findings and some suggestions for future work.

2. Measuring seasonal concentration with an interactive simulator

Seasonality is a key feature in tourism series and thus its measurement and understanding are basic competences that undergraduate students enroled in a tourism degree programme need to acquire. Although the essential ideas behind the causes and effects of seasonality in tourism are not particularly difficult to comprehend, the statistical techniques of measurement are not so easy to understand; especially the Gini index, and its associated Lorenz curve, which are also used to measure inequality and concentration in other tourism variables.

In order to provide students with a series of learning resources that can enrich their learning process in this specific topic, a microsite based on an interactive graphical simulator has been designed. Due to the challenges our students often face, special attention has been given to interactivity, which is recognised as a key feature of effective e-learning resources (Littlejohn, Falconer, & Mcgill, 2008). In particular, in the field of statistics learning it is also a recurrent idea that knowledge building is improved by interaction and that experimentation and simulations are valuable resources for a meaningful learning of the most difficult or abstract statistical concepts (Chance et al., 2007).

The approach followed is to propose a series of activities that allow the students to apply and test their initial beliefs about the properties of statistical measures and the effects of changes in the monthly distribution of several variables, which can be solved using the simulator in the line proposed by Cairncross and Mannion (2001). All the activities are contextualised, with most of them using real recent data from several sources.

2.1. The seasonal concentration lab

The resources created for this project are contained in a microsite called the 'Seasonal Concentration Lab'. This format allows the resources to be used either as a self-contained module for independent learners in a complete e-learning scheme, or as a complementary resource in a blended learning strategy, as is the case at the University of Malaga.

The microsite is structured into four sections: 'home', 'tutorial', 'activities', and 'info'. Its deliberately simple design allows easy navigation between the sections and activities, which was one of the primary goals in building this microsite. Every page is accessible from every other page of the microsite, especially the activities.

The tutorial section includes an explanation of the statistical concepts included in the simulator (i.e. the Gini index and the Lorenz curve), along with two real examples of seasonal concentration. The bibliographical references and statistical sources are grouped under the 'info' section, which includes links to all the external resources available on-line. In order to maintain a certain simplicity across the microsite, the reference list is relatively short.

The main section of the microsite is dedicated to the activities and includes nine activities in increasing order of difficulty. The first two activities require students to manipulate the monthly distribution of a series to find some properties of the