A case of in-streaming-learning: how to program with Z-tree software to design experiments on economic decision making

Un caso de aprendizaje en streaming: cómo programar con el software Z-tree para diseñar experimentos sobre la toma de decisiones económicas

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Abstract

In this paper, we present a real in-streaming case of learning about how to program with the z-tree software to design experiments on economic decision making for the members of the NECE Research Unit in Business Sciences, in Portugal. This real case of in-streaming-learning was created to respond the need of a teaching method based on new technologies for people who could be in different parts of the world and with different time availability, but they also need to learn to program z-tree to use it in their experiments. Researchers and students learned the Ztree software applications in business research and economic decision making. Specifically, they learned: What is z-Tree software?; What is z-Tree software for?; What advantages does it have? and What applications can you obtain in business research?; How to get it for free?; Technical requirements; The structure of z-Tree software, and How is it to be programmed?; Then, we exposed a practical example for how to create a small experiment of economic decision-making, and, finally other more complex example (with interaction between experimental subjects). This learning has been valued positively, as very useful. The paper includes the web with the training in streaming on z-Tree.

Keywords: Ztree; economic decision making; software of business research; software economic decision making; in-streaming-learning.

Resumen

En este documento, presentamos un caso real de transmisión de información sobre cómo programar con el software z-tree para diseñar experimentos sobre la toma de decisiones económicas para los miembros de la Unidad de Investigación de NECE en Ciencias Empresariales, en Portugal. Este caso real de aprendizaje en streaming se creó para responder a la necesidad de un método de enseñanza basado en nuevas tecnologías para personas que podrían estar en diferentes partes del mundo y con diferente disponibilidad de tiempo, pero que también necesitan aprender a programar z- árbol para usarlo en sus experimentos. Investigadores y estudiantes aprendieron las aplicaciones de software Ztree en la investigación empresarial y la toma de decisiones económicas. Específicamente, aprendieron: ¿Qué es el software z-Tree ?; ¿Para qué sirve el software z-Tree ?; ¿Qué ventajas tiene? y ¿Qué aplicaciones puedes obtener en la investigación de negocios

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?; ¿Cómo conseguirlo gratis ?; Requerimientos técnicos; La estructura del software z-Tree, y ¿Cómo se programa? Luego, expusimos un ejemplo práctico de cómo crear un pequeño experimento de toma de decisiones económicas y, finalmente, otro ejemplo más complejo (con interacción entre sujetos experimentales). Este aprendizaje ha sido valorado positivamente, como muy útil. El documento incluye la web con la capacitación en transmisión en z-Tree.

Palabras clave: Ztree; toma de decisiones económicas; software de investigación empresarial; toma de decisiones económicas de software; in-streaming-learning.

I. Introduction.

University researchers sometimes have difficulties to get together in one place and at the same time, because they have a large number of tasks, trips to conferences and various schedules. Therefore, in order to teach the members of NECE-UBI how to program with z-Tree for the design and the elaboration of experiments on economic decision-making, we decided the in-streaming learning to access the contents at any time, from anywhere, with an internet connection. The final result was an in-streaming video posted on a website about how to program with z-Tree and its applications in business research.

Technical requirements and methodology

To create the online video, MOOC type, several steps were followed: First, the "Story Board" of the video was created; We thought about everything we wanted to appear in: the images, the videos, the transitions, the audio content... Second: the videos of the "Story board" were made using Cam Studio program, with screenshots of the execution of the z-tree program. In this moment, the last version of z-Tree software is 3-6-7, and it has been created in the summer of 2016 and has been programmed by Urs Fischbacker & Stephan Schmid from the Faculty of Economy of the University of Zürich. This online, in streaming learning was programmed and conducted with the software z-Tree (Fischbacher, 2007). The applications are programmed in Visual C++. We can use a 32 and a 64 bit resolution, versions of Windows, starting with Windows XP, the version SP3. The z-Tree software is implemented as a client-server application with a server application for the experimenter, called z-Tree, and a client application for the subjects, called z-Leaf. We can download the Open leafs program in this website: http://www.ereuben.net/teach/zTreeTestEnvironment.zip.

Third: the images that would have the final complete video were made, using screenshots of images made with PowerPoint. Fourth: the audio that would have the informative video with the "Notas de voz" program of the IOS operating system, of the IPhone 5S mobile was recorded. Fifth: the video was edited with the IMovie program for Mac. Sixth: the video was posted on a YouTube account. Seventh: a website was created with Google Site to present the video and give the access link to the students and researchers. And, finally, the video was linked to the web. The student-researchers had the possibility of evaluating the training through a link with an online evaluation questionnaire, accessible through the website.

Content

The objective of this in-streaming learning was to show what is z-Tree software and its applications in business research. For this reason, the content of this learning was:

What is z-Tree software?

z-Tree is a software that has been designed by Urs Fischbacker, and has been programmed by Urs Fischbacker & Stephan Schmid from the Faculty of Economy of the University of Zürich. The authors began the development of the software in 1998, and have continually added new features that you can find in theirs own website. There are people in Google that create new applications for z-Tree too.

What is z-Tree software for?, What advantages does it have? and What applications can you obtain in business research?

z-Tree is a software package for developing and carrying out economic experiments, and for create the presentation of an experiment through a computer, or a group of computers connected in network. The language used to define the experiments is simple and compact, meaning that experiments can be developed quickly, and programming experience is not necessary, though useful. z-Tree is flexible both with respect to the logic of interaction and the visual representation.ith z-Tree software you can make experiment presentations, conducting questionnaires, normal form games, extensive form games, double auctions and, for example, clock auctions.

How to get it for free?

You can obtain a license to work with z-Tree only for academic or investigation reasons (not for commercial issues). To obtain a license you must fill out an application form in the website: https://www.uzh.ch/ztree/ssl-dir/index.php (figure 1).
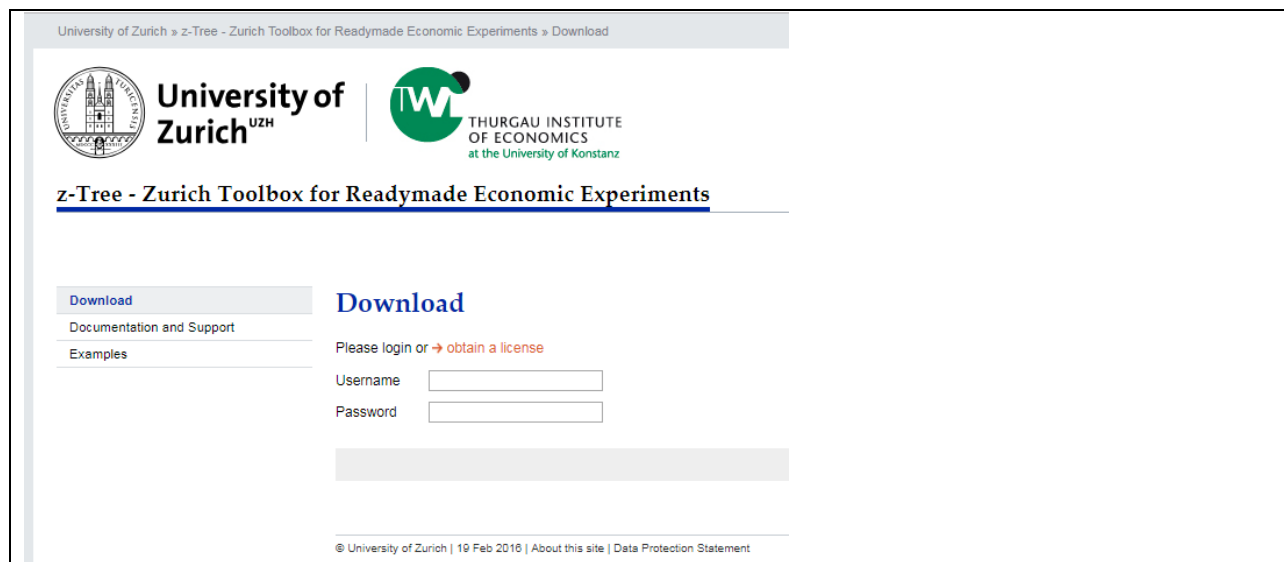

Figure 1. An image of the website of z-Tree from the University of Zurich.

Technical requirements

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implemented as a client-server application with a server application for the experimenter, called z-Tree, and a client application for the subjects, called z-Leaf (figure 2).
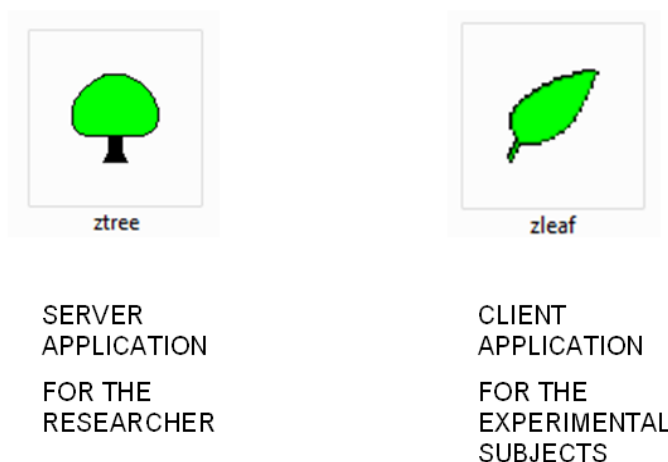

Figure 2. The structure of z-Tree software.

So, to program the research, you must work in the server application, in z-Tree, and to prove if the program you have created is all right, you can prove it in z-leaf application. All the information of the experiment that can be show to the experimental subjects will appear in the z-Leaf application.

Programming with z-tree

There´s differents sections of the z-Tree application:

- Backgroung is where you can define the general parameters like the number of subjects of the experiment, the number of groups, if there is any practice period before the paying periods, or, the number of paying periods of the experiment, and, of course, the language of the z-Leaf.

- Treatment: is where you define the different phases of the experiment.

- Stage: it is one phase of the experiment.

- Active Screen is where you can design what the experimental subjects can show in the computer during the experiment. In this section you can design text boxes, information that could read the experimental subject, buttons to, for example, accept, or continue in the experiment to another stage, and so on.
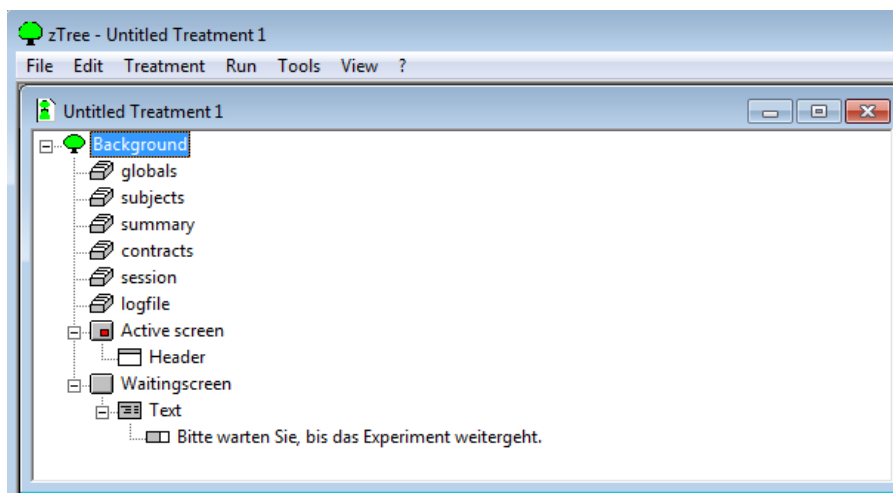
Figure 3. This is the appearance of z-Tree.

A logic order to program an experiment could be:

First_ define the general parameters in the background (and the language)

Second – create a treatment

Then- create a stage

Define the variables, incorporate the programs

And, finally, design the Active Screen

But it is also possible to change any aspect previously programmed.

When you open z-tree application, you find an untitle treatment 1.

The language that experimental subjects will show, by default, is German. If we want to change the language of the experiment, we will have to close this treatment 1, select Treatment-language- and choose the one we prefer. In our example, we choose Portuguese from Portugal. Then, we can check the Portuguese language of the experiment go to: File – New treatment- Background- Bankruptcy rule. In General Parameters, that appears when open Background, you can define the number of subjects of the experiment, the number of groups, if there is any practice period before the paying periods, or, the number of paying periods of the experiment.

Link to the in-streaming learning

In addition to this content here exposed, on the web with the in-streaming learning was exposed step by step how to program a simple experiment on economic decision making, and another more complex (the game of ultimatum) where interaction between the experimental subjects occurs when they have to decide.

II.   Results.

The final result of the training was an online training resource, in streaming, accessible anywhere and anytime through the Internet, where it explains what z-Tree is, what it is for, and how it is used not only at the theoretical level, but also with practical examplesThe people who evaluated the training considered it very useful.

III. References.

Fischbacher, U. (2007). z-Tree: Zurich Toolbox for Ready-made Economic Experiments, Experimental Economics 10(2), 171-178.

Web Sites

Official web of z-Tree: (http://www.ztree.uzh.ch/en.html)

Web of the streaming-learning on z-Tree: (https://sites.google.com/view/ztreesoftware)

Web to download the OpenZleafts program: (http://www.ereuben.net/teach/zTreeTestEnvironment.zip)

Web to obtain the licence: (https://www.uzh.ch/ztree/ssl-dir/index.php)