



BE 1.2: DIGITAL RESOURCE FOR THE BIOSTATISTICS COURSE IN THE VETERINARY MEDICINE COURSE

BE 1.2: RECURSO DIGITAL PARA LA ASIGNATURA BIOESTADÍSTICA EN LA CARRERA DE MEDICINA VETERINARIA

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The Biostatistics for the career of Veterinary Medicine is one of the subjects identified in the UNAH, as of more motivation (present and not present modality). The necessity to have a digital resource that systematizes the learning that contributes from an efficient way to favor the independent activity and that it offers possibility of integration of information, they are the bases on those that are sustained the investigation. It is objective to design a tool that facilitates the use and the handling of the information of the Biostatistics under the current conditions. With this material for the teaching the spectrum opens up for a number bigger than alternative as for giving solution to the problem of the preparation of the students to assume a process of teach-learning efficient. BE 1.2 it contains video, bibliographies, complementary materials, problems and databases for works extra classes and study guides for the topics. The professors and students have they express full satisfaction with the obtained product.

Keywords: Statistic, digital tool, Veterinary, TIC's

La Bioestadística en la carrera de Medicina Veterinaria es una de las asignaturas identificada en la UNAH, como de mayor motivación (modalidad presencial y semipresencial). La necesidad de contar con un recurso digital que sistematice el aprendizaje, que contribuya de manera eficiente a favorecer la actividad independiente y que brinde posibilidad de integración de información, son las bases sobre las que se sustentan la investigación. Es objetivo diseñar una herramienta que facilite el uso y el manejo de la información de la Bioestadística en las condiciones actuales. Con este material para la docencia se abre el espectro para la preparación de los estudiantes para asumir un proceso de enseñar-aprender eficiente. BE 1.2 contiene videos, bibliografías, materiales complementarios, problemas y bases de datos para trabajos extraclases, y guías de estudio para los temas. Los profesores y estudiantes han expresan plena satisfacción con el producto obtenido.

Palabras clave: Estadística, herramienta digital, Veterinaria, TIC's

INTRODUCTION

In recent times, universities are experiencing a change of some importance in the role that TIC's plays. (Salinas, 2002). The world of the future will be an even more intense struggle against the limitations of our intelligence. (Rajsbaum, 2016).

That is why Area, *et al.* (2020) consider that the universities that have not had problems in the development of virtual work are those that in their training policies

had considered the use of TIC's as part of their educational model.

For Tello (2014) it is explained that image, sound, text and voice have a profound impact on people today. All these elements intervene in TIC's and contribute to the base of operations that are used for capture and adaptation when formats, procedures and processing, storage and transmission of the meaning that is reproduced carrying a message are reproduced.

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The Biostatistics subject taught in the Veterinary Medicine degree is one of the subjects that has been identified, by the group of Statistics professors at the UNAH, as having the greatest motivation, both in the face-to-face and semi-face-to-face modality, which is why. Therefore, there is a need to have a work that systematizes learning, that contributes efficiently to promoting the independent activity of the student and that provides the possibility of integration of information and interactivity are the bases on which the research carried out is based.

Information and Communication Technologies (TIC's) have an increasing influence on the way we communicate, learning and life. The challenge is to effectively use these technologies so that they serve the interests of all students and the entire educational community (UNESCO, 2017).

According to Castellanos (2017), in recent years, the introduction of TIC's in education has had a significant boom. For Gómez (2018), in recent years, the introduction of TIC's in education has had a relevant boom. These two criteria comment on a relevant boom in TIC's for Education, reasons that are shared by the group of Statistics professors at UNAH since the advance of TIC's has allowed it to be an important tool in the development of the teaching-learning process. Currently, education throughout the world must face the challenge of using technologies as a pedagogical tool, since they constitute a challenge and an opportunity at the same time for the improvement of study plans, especially in the Veterinary Medicine career with in order for students to develop strategies that will help them face and solve the needs of future society. Therefore, the main protagonist of the teaching and use of these TIC's is undoubtedly the students.

It is a current problem for careers, with the incorporation of Plan "E", the updating of the bibliography for teachers and students, as well as the obtaining of software or multimedia that facilitate the acquisition of knowledge in the subject of Statistics, being employment of ICT in teaching for the new university, a task in which all researchers are involved.

Peláez and López (2006) have proposed a methodology for the development of Educational Software, from the LATED projects.

The foundation or importance of this work lies in relying on the face-to-face or semi-face-to-face study model on which the learning activity is carried out, which requires the increasing and successive incorporation of teaching aids. Therefore, contributing in this sense from the Biostatistics subject, to be in principle the driving force and catalyst of change, is a task to accomplish.

For this reason, the general objective of this research was related to designing a tool that would facilitate the use and management of information from the Biostatistics subject for the Veterinary Medicine career under current conditions.

DEVELOPMENT

Tool proposal, design and structure.

As Cebrián (2018) points out, multimedia as an educational tool must consist of all the essential components when covering a subject. This digital resource for Biostatistics is an access route for all students who wish to learn about this subject, as well as a very significant resource when teaching it, which is why all the multimedia was designed for the development and the publication of teaching materials. The presentation and main screen are very pleasant and is designed by LATED (Laboratory of Educational Technology).

The digital material has various options that are resources of interest, among which are:

1. Home.
2. Presentation.
3. Professional Profile.
4. Biostatistics Strategy.
5. Extra-class work.
6. Credits.
7. Bibliographies.
8. Go out.
9. Other options (Orientation Activities, and Affective and Productive Animals).

Each of these options is described below:

- The **Home** proposes a video prepared in Flash for the promotion of digital material aimed at the Biostatistics subject for the Veterinary Medicine career (Figure 1).
- The **Presentation** contains an explanation in the form of help for the use of the tool, with the objective that the user channels doubts with the execution of the digital material (Figure 2).
- In **Of the Professional Profile**, information is provided to students about the spheres of action, the field of action, the professional functions and the possible locations of a graduate of this career (Figure 3).
- The **Biostatistics Strategy** is an option that, when consulted, provides information on the essential premises about the Biostatistics strategy by years, subjects, disciplines, contents and forms of evaluation (Figure 4).
- In **Extraclass Work**, guidelines appear to form and structure the document that students must submit as an evaluation (Figure 5).
- The **Credits** provide information about the work team that worked to obtain this digital material (Figure 6).

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FIGURE 1. Screen with the Start option.



FIGURE 2. Screen with the Presentation option.



FIGURE 3. Screen with the Professional Profile option.



FIGURE 4. Screen with the Strategy option of Biostatistics.

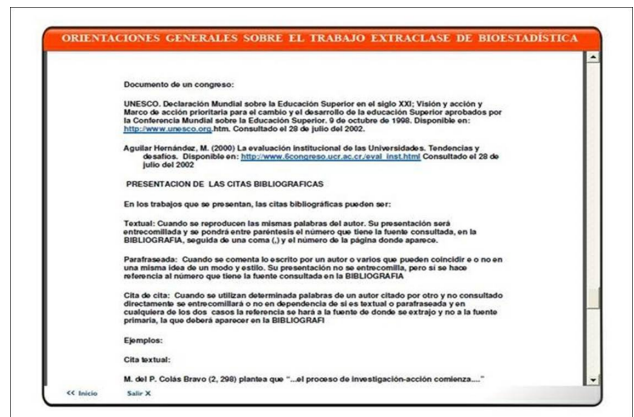


FIGURE 5. Screen with the Work option. Extra class.

- In **Bibliographies** there are opportunities to consult two Statistics textbooks and three Complementary Materials that were prepared by the UNAH Statistics Collective that will facilitate the study of Biostatistics (Figure 7).
- The **Exit** button allows the user to conclude work with the digital material. When applying this option, the final Credits of the work team are displayed in the multimedia.

- There are other options on the main screen that can be very useful:
- **Orientation Activities** provides 9 videos that cover the study topics of the Biostatistics subject, they contain guidelines for learning, content, examples and algorithms for the use of a statistical package for data processing.
 - **Affective and Productive Animals** contains a total of 80 problems related to the Veterinary Medicine career, and

each one has a very complete database so that the student can do the Biostatistics practices or to compose the Extra class Work in the Biostatistics subject (Figure 9).

As a note of interest, it should be highlighted that in each action that the user executes with the multimedia, Martian quotes appear that are part of the work with values that is being carried out in the Educational Strategies of the new Cuban University.

According to Labañino (2019), taking into account the multiplicity of tasks that have to be solved when developing some application, most systems integrate a multi-tool approach in their containment, which guarantees the processing of different types of media (graphics, sounds, videos, etc.) through their own utility programs, but generally from the interface of the system's work environment.

To create the tool, the following software and systems were used that allowed it to be assembled:

- **PhotoShop 10.** Adobe program package software will allow editing and transformation of images used in multimedia.
- **Macromedia Flash 2014.** Software from the Macromedia program package, it is used in the design of animations that brings multimedia to life in the visual aspect.

- **Microsoft Office PowerPoint 2013.** Software from the Microsoft Office package was used to create the slides that were used in the construction of the Teleclasses.
- **Corel Draw 14.** System for graphic interface design in digital and printed media.
- **Windows Media Shrink Encoder 9.** To encode the filmed Teleclasses.
- **Microsoft Office Word 2017.** Software from the Microsoft Office package was used to edit texts that were used in the bibliography.
- **Mediator.** Software that allows you to create multimedia based on the options it provides.
- **Macromedia Dreamweaver.** For editing style sheets in the design tool.

The following prerequisites are recommended for the correct use of the digital tool:

1. It is recommended to install the Framework and the Adobe Flash Player for the correct visualization of the tool.
2. Check your computer's regional settings:
 - Decimal separator: , (comma)
 - Thousands separator: . (spot)
 - Negative sign: - (hyphen)

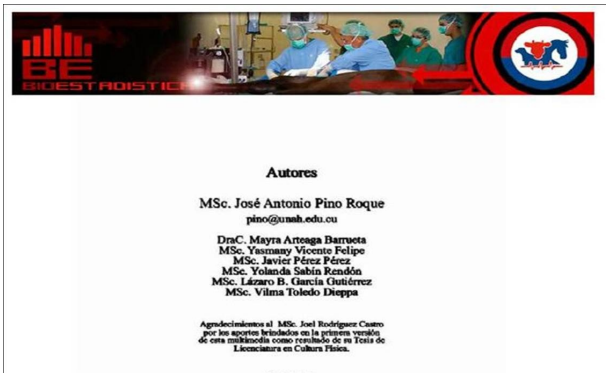


FIGURE 6. Screen with the Credits option.



FIGURE 7. Screen with the Bibliographies option.

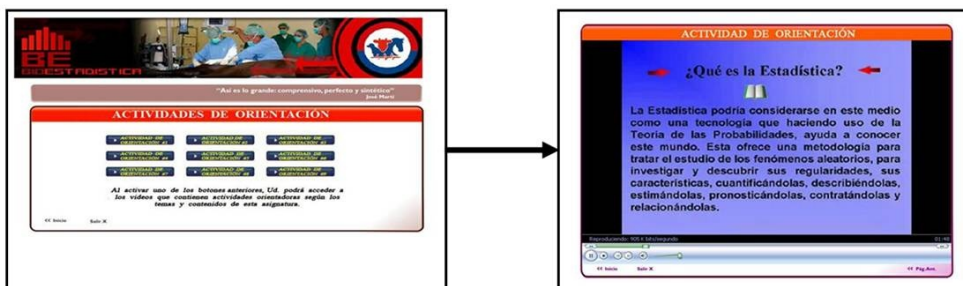


FIGURE 8. Screen with the Orientation Activities option.



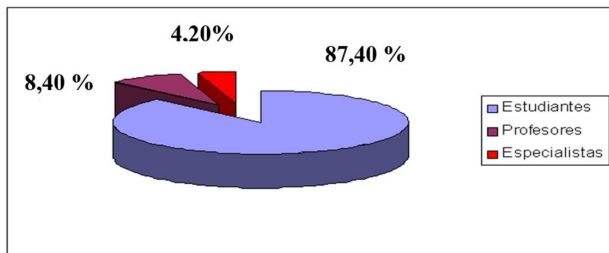
FIGURE 9. Screen with the Affective and Productive Animals option.

About the application of the digital tool

A survey of students, teachers and specialists in the subject was used, an interview with personnel trained in this subject, and an assessment by a research work team, specialized in the creation of this type of digital tools. Below is a summary of the results obtained.

Analysis of the survey applied

This tool aimed at facilitating the use and management of information from the Biostatistics subject has been presented to students of the Veterinary Medicine career (CD and CPE) at UNAH, as well as to professors and specialists related to the subject. The survey was implemented in 104 students (87.40%), 10 teachers (8.40%) and 5 specialists (4.20%) of the LATED Project. The instrument was processed and analyzed with the objective of collecting information on the effectiveness of the digital material and the resolution of the problem to be investigated (Graphic 1).



GRAPHIC 1. Sample of students, teachers and specialists.

The 10 teachers surveyed (100%) are satisfied with the use of this teaching medium and consider it a very

useful tool to raise the quality of teaching in terms of mastery of the Biostatistics subject. The teachers agree when proposing that it be a support material to teach these contents for this degree, that the bibliography proposed is good and extensive, and that the digital material is aimed at facilitating access to contents of the subject in the degree. Veterinary Medicine, increasing the interaction of the student with what he learns, thus developing his independence towards the study, stimulating the motivation to learn the various topics covered through the video teleclasses, where aspects of the current program and others that are oriented are oriented. They help expand knowledge.

The 5 specialists in Educational Technology consider that the proposed product can be used by CD and CPE students, or teachers since it allows the student to study in a more enjoyable, dynamic and attractive way all those contents of interest to him for learning Biostatistics.

The students also received the material with great motivation and interest, expressing their great satisfaction with it, and 100% of those surveyed stated that they had received a product that was very easy to access, with a very pleasant environment that motivated learning, as well as for raise the level of general knowledge of the world of Biostatistics. They consider the images used very fresh and pleasant.

Analysis of the applied interview

An interview was applied to 10 professors and 5 LATED specialists, where very satisfactory criteria were obtained from the material presented.

From the questions proposed in the interview, the following conclusions were reached:

1. 100% of those interviewed stated that the tool aimed at facilitating the use and management of information from the Biostatistics subject is very interesting and has the requirements to be used as a teaching medium for working with this subject.
2. 25% of these professionals propose that self-assessment exercises with a higher percentage of complexity can be incorporated into another version of the digital material.
3. 100% of those interviewed consider that the product is very useful in virtual learning environments since it can be used in distance learning using new technologies, and it can also be exported to other platforms or CDs. for those places where there is no Internet access.

Endorsements granted by specialists who valued multimedia

The Scientific Commission of the Department of Physical Mathematics of the Agrarian University of Havana "Fructuoso Rodríguez Pérez" endorses the material as positive and interesting and that it constitutes a means of teaching that should be extended to other careers that are present in our educational system.

The Evaluation Commission of the Educational Technology Project (LATED) of the Agrarian University of Havana "Fructuoso Rodríguez Pérez" considers that multimedia meets all the requirements to constitute digital material of obligatory consultation for students and teachers who wish to delve into the world of Biostatistics.

As stated by Arriaga, *et al.* (2021) the teacher's task is reinforced with the use of ICT because it allows the teacher to progressively improve the exchange of information and the ubiquitous work that the student can develop from a distance.

CONCLUSIONS

The important results of this research work include:

1. The theoretical and methodological foundations that support a tool aimed at facilitating the use and management of information from the Biostatistics subject in the Veterinary Medicine degree with the support of TIC's are:
 - The pedagogical, didactic and methodological foundations of teaching the Biostatistics subject.
 - The methodology of using TIC's in teaching processes as a strategic ally of the teacher.
2. The necessary technological and computer resources that must be taken into account for the development of this tool for the Biostatistics subject are:
 - Software for graphic design and production of audiovisual resources.

- The Mediator as software for the formation and integration of resources for digital material.
3. 100% of the users who have used this tool have expressed full satisfaction with the product provided and state that:
 - It is a reference and work material for students and teachers that allows quick access to address content on Biostatistics.
 - It is possible to increase the student's interaction with what he learns, thus developing his independence towards study, through a teaching medium that stimulates the motivation to learn the various topics covered in the proposed material.
 - It encourages the student to study in a more enjoyable, dynamic and attractive way all those contents of interest for learning Biostatistics.

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