

# Survival And Risk Analysis In Business Learning Through Podcast

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**Abstract:** The most important disadvantage in nowadays business training is the use of the face-to-face method due to the conditions of the global pandemic. This research examined the learning level, worker's characteristics (gender, previous experience, age and level of study), influence of episode's duration (5 Mn and 10 Mn) and the frequency of podcast emissions (once and twice a week) in the drop out, in a retail company of computing devices. The results, specified in a Pre-test Posts design, factorial experiment and survival analysis, indicated that dropout is directly related to the frequency of emission of the episodes. The factor group with the highest percentage of survival at the end of the four weeks was the group with the treatment that lasted 10 minutes and a frequency of once a week every Monday. It was also found that the average percentage of learning improved, by 5.70 points compared to the average of the initial learning. Our results indicate that there is a 56% probability when workers have previously taken virtual capabilities other than a podcast. They found that gender, age, and level of studies are not associated with either drop out or learning level. Finally, he discovered that the highest risk of attrition is in the third week, when the podcast episodes are 10 Mn and are broadcasted twice a week. They discuss possibilities to decrease attrition through business podcasts.

**Index Terms:** Business podcast, education, Level learning, risk, survival.

## 1 INTRODUCTION

TECHNOLOGICAL advances in education, facilitate the understanding of pedagogical content. Through illustrations, images, ear canals, and interactive presentations, teachers have successfully increased student motivation. According to [1], the incorporation of technology in educational methods is facilitating the interaction of students, teachers and their physical environment. These technological advantages have revolutionized the way of educating and have become an essential part of education to such an extent that it is impossible to conceive of education without the use of scientific tools. Educational technology has created different tools that facilitate and support the educational process of students. These tools allow teachers to optimize interaction time and be closer to students. According to [2], technological tools allow teachers to faster transmit information, optimizing time regardless of their geographical location. According to [3], the incorporation of technological tools in education allows teachers to have different methods to explain the same content and students are experiencing different learning methods. Similarly, educational institutions are using technological training tools such as virtual platforms, webcasts, videoconference, blogs and podcasts. Podcasts are audios or videos that can be downloaded and/or listened from a digital platform. Its contents can be published in episodes to be listened periodically. These episodes are transmitted through an RSS (Really Simple Syndication) or feed file broadcast system, which allows the user to subscribe to the channel be notified when new episodes are published. The term "Podcast" comes from the acronym; Pod (Personal On Demand) and Broadcast, and its emergence is due to the demand for computers and multimedia music players [4]. Podcasts had their innovative period in early 2000. According to [5], Ben Hammersley used the term podcast for the digital version of "The Guardian" in 2004. In that year Dave Winer and Adam Curry released version 0.92 of [the RSS](#), and for the next two years they spent testing podcasts in mp3 or blog format. Podcasts developed different topics of interest to different users. Because podcasts are a very easy and dynamic tool, they have been used in different educational entities worldwide and in different knowledge areas such as medicine [6], languages and mobile technology [7]. In the medical course,

students developed the topics of the subject with the help of podcast audios; the results showed increased preparation and participation in the classroom [8]. In the foreign languages course, the participants achieved improved their pronunciation by repeatedly listening to episodes [9]. They managed to increase attitude levels and retained more vocabulary when listening to the episodes in this modality [10], [11]. Finally, in the area of technology, podcasts were used to train people in mobile electronic learning, concluding that these audios motivated and increased the learning of attendees [12]. Different educational institutions have incorporated podcasts in their educational methodology to establish whether this tool increases learning and determine which variables are related to teaching; type of podcast (audio or video), technological devices, duration of episodes, gender and age of listeners. The acceptance of the podcast is influenced by different variables. Variables such as technological devices, duration of the episode, gender of the announcer and age of listeners can affect the acceptance of this technological tool. According to [13], it is necessary to educate podcasters and listeners to achieve acceptance within the educational community. Some listeners have been born into a technological society and it has been easier for them to adapt and incorporate the podcast into their educational routines. However, for teachers, technology is a new tool in their pedagogical methods. On the other hand, technological devices influence the level of acceptance of podcasts. According to [14], devices and technological infrastructure affect the implementation of technological services in the academic community. Frequent access and good quality internet makes it possible to increase the use of podcast, because podcasts are listened to on virtual platforms. The gender of the listener has been another variable that has been studied by different authors. Experimental results indicate that women prefer traditional learning methods such as reading, while men prefer audios [6]. The variables duration and type of episodes have not been studied in depth and for this reason, in many reports they are part of the proposals for future scientific studies, in order to find the appropriate combination that an episode should have and thus increase its acceptance level. These concepts outlined above should make clear why podcasts are so important in education. However, it is pertinent to

mention in detail all the studies that have been carried out on podcasts, specifically in the educational sector, analyzing a representative sample of the published information. This work aims to show a bibliographic review of articles published in different international journals that make contributions to the scientific community. In the first section there is an analysis of the Colombian podcasts (2019-2020) and their use in different topics; in section two, two experiments are provided (Pre-Test, Post-Test and Factorial) to understand the impact of the independent variables about the level of learning. Then, in section three, we present a survival and risk analyses over a four-week period. Finally, the work ends with a Discussion, in which recommendations are made for further research on the subject in the future.

## 2 METHODS

The research used a qualitative methodology and was developed in three stages: (1) Non-experimental research, (2) Experimental research for "pure" experiments and (3) Evidentiary research. The first stage was divided into two steps: (a) causal correlation of podcasts in Colombia and (b) first part of the Pre-Test-Post-Test experiment, with a control group to know the level of initial knowledge of the participants. On stage (2), two steps were carried out: (a) experimental research with "pure" experiments through 2x2 factorial design, to analyze the effect of design factors on the level of learning and (b) longitudinal study for designs of evolutionary analysis of the group, to know the increase in the level of learning and to carry out an analysis of survival and risk of the participants in the different factor groups. Finally, in stage (3), two steps were performed: (a) second phase of the Pre Test-Post-Test experiment and (b) training of the control group. The training was free for company employees.

### 2.1 Instruments

The data collection instruments were created on a digital platform and developed by the researchers. Two instruments were applied: Registration form, demographic characteristics and previous experiences in the training of the participants were collected. Individual Learning Level (ILL), a psychometric analysis was carried out on the selected topic to be taught; This instrument was used in the Pre-Test, the weekly evaluation and in the Post-Test. The questionnaire had four constructs and 14 items, each item constituted a multiple-choice question.

### 2.2 Participants

During the period between March and May 2020, the registration platform reported that 155 participants registered for the entire investigation. They belonged to a Colombian brand that distributes world-renowned technology products: mobile phones, tablets, and computers. The characterization was as follows: Gender: 21 women and 34 men, and Level of education: Undergraduate Completed (33.3%), Technologist Completed (18.5%), Undergraduate Unfinished (16.7%), Technologist Unfinished (9.3%), Technologist Completed (7.4%), Unfinished Technologist (5.6%), Graduated (3.7%) and Specialization (3.7%). The time in years that participants have been in the company had an average of ( $M = 3.22$ ,  $SD = 2.79$ ), represented as follows: (31.5%) have been in the company for 1 year, (24.1%) for two

years, (11.1%) have been 4 and 5 years, (7.4%) 3 and 7 years, (3.7%) have been in the company for 6 years and (1.9%) have been in the company for 8 and 17 years. The company areas to which the participants belong was (98.1%) to Sales and Clients and (1.9%) to Quality and Technical Service. Their position in the company is represented by: Store Administrator (53.7%), Store Manager (40.7%) and Corporate Sales Executive (5.6%). The type of training previously received is represented in: On-site and Virtual (37%), Virtual (35.2%) and Presence (27.8%). The number of trainings received on time management had an average of ( $M = 2.81\%$ ,  $SD = 2.38\%$ ), represented in: One year training (38.9%), two year trainings (24.1%), three year trainings (11.1%), four year trainings (9.4%), five year trainings (3.7%) and for six, seven and eight year trainings (1.9%).

### 2.3 Data Collection and Analysis

Participants were recruited by the participating company over a two week period, using a digital poster. The registration form gathered information on gender, age, academic level, previous training experience, type of training received and position in the company. The initial evaluation form was provided at the time of registration, and the weekly evaluation each time the module was completed; on weeks one and three, four questions were asked and in weeks two and four, three questions. Finally, this same instrument was used 10 days after the end of the course within the Post-Test stage. The predicted variables were dropout and learning percentage. The evaluation form was completed at the end of each week through the offering platform, once the podcast episode was heard. There were no data lost in the instruments because all the questions were mandatory. The participants answered the evaluation every week until the end of the course in week four, this allowed to follow the periodic and final dropout. The episodes were stored on the SoundCloud platform that allowed to host, play and download audios in MP3 format on any mobile device. Participants received the announcement of the episode's publication according to their position within the factor group. For the factorial group (1), the episode lasted 5 min. once a week and was released on Wednesday. The factorial group (2) had an episode duration of 10 min. once a week and was broadcast on Monday. For the factorial group (3), the time of the episodes was 5 min. twice a week and issued Tuesday and Wednesday. Finally, the factorial group (4) had a duration of episodes of 10 minutes twice a week, broadcast Tuesday and Thursday. Participants from all groups received the episodes at eight in the morning.

## 3. FINDINGS

We use SPSS version 25 for data analysis. The analysis was carried out in three stages: Non-experimental, experimental and evidence. The non-experimental stage was developed in three steps. In the first cross-sectional step (A) with exploratory phase, an analysis of the literature found from 2005 to 2019 was carried out. The research carried out a bibliometric analysis based on the concept of educational podcasts as a business pedagogical tool [15], [16]. To do this, we first designed the search equation in the SCOPUS database in which keywords such as: Podcast learning and business were included. As a result, 796 documents found in the database were obtained, which were

later downloaded into a Bibtex compressed file to be analyzed with the R study program. Through the Bibliometrix tool and the Biblioshiny library, the literature analysis was carried out to identify the most relevant articles on the subject matter and the main variables investigated. The results indicate that: the countries with the highest number of scientific article publications referring to the use of podcasts in education; United States, United Kingdom, Australia, Germany and Canada as the first five countries. The author with the highest number of publications is Kennedy MJ, the university with the most research is Charles Sturt University and the most cited magazines is the Journal of Adolescent and Adult Literacy. The variables that had the greatest impact in the studies carried out with respect to increasing the level of learning of the individuals were: gender of the announcer, duration and frequency of emission in the episodes; which were the variables studied in the factor analysis, Fig. 1.

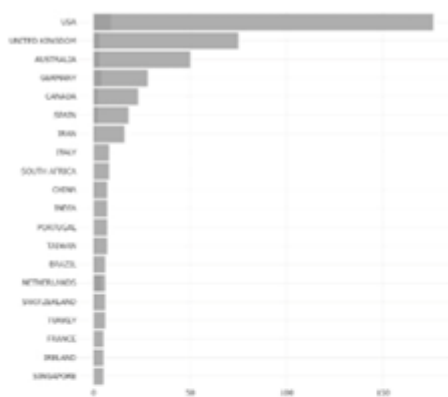


Fig. 1. Most relevant magazines, Source: Bibliometrix.

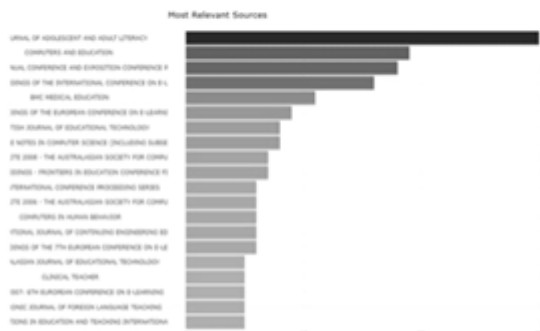


Fig. 2. Survival Function. Source: Authors' construction with results

In the second causal correlation step (B), 175 Colombian podcasts broadcast during the January 2014- January 2020 period was analyzed. The episodes analyzed belong to the 34 iTunes podcast channels. These episodes dealt with different themes such as history, politics, economy, culture, music, art, among others. Variables were analyzed: broadcast frequency, number of broadcasters, gender of the broadcaster, category, launch day and channel to which each podcast belongs. The results indicate: (1) There is a relationship between the gender of the participating speakers and duration time  $H(2, N = 175) = 15.24, p < .0$ . Listeners prefer a female voice and run for nine minutes per episode. (2) There is a relationship between the duration of the episode and the category of the episode  $H(14, N = 104.17, p < .0$ . The podcasts on eco-

nomy and business prefer to be listened to in a time duration of 29 minutes. (3) There is a relationship between episode length and episode release day  $H(6, N = 175) = 42.14, p < .0$ . Listeners prefer 10-minute episodes to be released on Mondays and five-minute episodes to be released on Wednesdays. (4) There is a relationship between the episode broadcast frequency and the episode launch day  $H(6, N = 175) = 24.2, p < .0$ . Listeners who listen to an episode frequently once a week prefer that launch is on Fridays, and those who listen to an episode twice a week prefer that the launch be on Tuesdays. (5) There is a relationship between the broadcast frequency and category of Podcast  $H(14, N = 175) = 24.2, p < .0$ . Listeners in the economy and business category prefer the pod broadcast frequency cast once and twice a week.

TABLE 1  
Theoretical factors

Theoretical factors	Number of foundations	Example of the foundation
5s	5	Organize the workspace efficiently to eliminate non-productive time
First thing's first	5	Dividing activities according to importance helps organize time
MCI	5	80% of your efforts affects 20% of your goals
The businessman at the minute	5	Splitting responsibility for different tasks prevents work overloads

Theoretical factors of locus of control in time management

In the third step (C) Pre-Test-Post-Test experiment with a control group, it had two parts; the initial part that sought to know the participants' initial level of knowledge and the final part that determined the variation in prior knowledge regarding the intervention [17]. For the initial part, the Individual Learning Level (ILL) measuring instrument was internally and externally validated. The results showed a high internal consistency, with a Cronbach's alpha (0.78 for clarity and 0.88 for coherence) establishing that the instrument was reliable. In the internal validation, the results with AFE were as follows: (a) An analysis of the components with Varimax rotation because the correlations between items were  $< 0.70$ . (b) The final iteration presented the eigenvalues in four factors, which presented a convergence in four iterations that explained 61.94% of the variance. (c) Of the 20 initial items, it was established that only 14 of these described the constructs with loads  $> 0.40$  and communalities  $(h^2) > 0.35$ . (d) The final instrument presented a significant Bartlett's sphericity test  $\chi^2(1, N = 91) = 423.21, p < .0$  and an indicator of the adequacy of the sample size Kaiser-Meyer-Olkin (KMO) 0.77 ; establishing that the chosen items define the theoretical factors of Time Management. The average learning level of the control group was  $M = 59.61, SD = 5.91$  and for the experimental group it was  $M = 61.2, SD = 4.28$  (Table 1). The final part Post-Test, was applied to the same Pre-Test subjects (control and experimental group), using the same research instrument, after they participated in the experimental phase or reading the material; the results can be consulted in the verification stage. Two steps were developed in the experimental stage: transactional study and longitudinal study. Step (A) transactional study, developed an experimental investigation through a 2x2 factorial design; The effect of design factors on the increase in the level of learning was analyzed. Three analytical techniques were used in this step: univariate,

correlational and ad hoc. The first technique (1) univariate analysis, made the influence of the learning and dropout variables. Univariate analysis allowed to study the effect of various factors on the dependent variable individually and together. The frequency and duration of the episode were taken as factors for each treatment. In the univariate analysis of the learning variable, the inter-subject effects test yielded a ( $p > .05$ ) for the factor, frequency, duration and multiplication of both factors. This indicates that there is no relationship between the learning variable and these factors. In the univariate analysis of the dropout variable, the intersubject effects test yielded a ( $p > 0.05$ ) for the duration factor, frequency and the multiplication of both factors and a ( $p < .05$ ) for the frequency factor. This indicates that there is a relationship between the frequency twice a week and the dropout variable ( $M = 1.45$ ). The second correlation analytical technique (2) found that there are no relationships or associations individually between the variables dropout and learning level and the variables: Years in the company, Area in which you work, Position, Number of training sessions previously received, Gender of the participant, Number of educational podcasts listened to, Number of types of podcast listened to, Type of training received and Level of education. The third ad hoc analytical technique (3) of the decision tree was intended to know the relationship between the variables. The analysis included the variables: Years in the company, Area in which you work, Position, Number of training sessions previously received, Gender of the participant, Number of educational podcasts listened to, Number of types of podcast listened to, Training modality received, Level of schooling, the frequency of the episode and duration of the episode. Regarding the variable Level of Learning, the probability of passing trains in all factor groups was analyzed and 3 terminal nodes were obtained under CHAID processing. The minimum number of cases for the parent node was 5 and for the child node 2. It was found that the variable modality of training received and frequency of the episode has a probability over the Level of Learning. Node zero shows that the probability of passing the training is 41% ( $N = 16$ ) and the node with the highest probability of passing is represented by Node 2, when the students have had virtual training (56%,  $N = 2$ ). The subjects of Node 4, who have a 50% probability of passing the course, stand out when they have listened to the Podcast at least once a week and have had virtual training. The model matches the variation with 66.7% and test error = 0.075. Regarding the dropout variable, no variable was found associated. In the longitudinal study for group evolutionary analysis designs, we sought to know how dropout occurs throughout the training. This analysis was carried out through the survival analysis for each factorial group and sought to know the time elapsed until the participant's desertion occurs as the risk of desertion [18]. The survival function of all factor groups in the training indicates that there is an average mortality rate of 2.71 weeks. Dropouts per week were as follows: first (46%), second (49%), third (55%) and fourth (75%). Regarding the factor groups, the survival function indicates that the highest probability of final survival is the treatment position (10 min. And 1 time per week) with 45%. The other groups had a survival between 27% and 9%, Fig. 3.

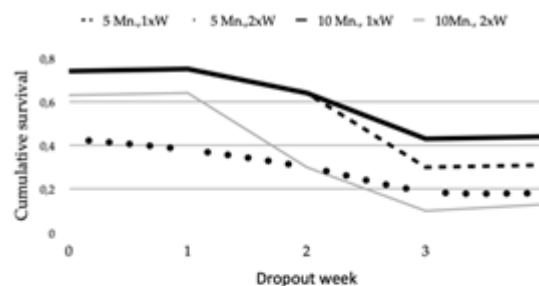


Fig. 3. Survival Function. Source: Authors' construction with results

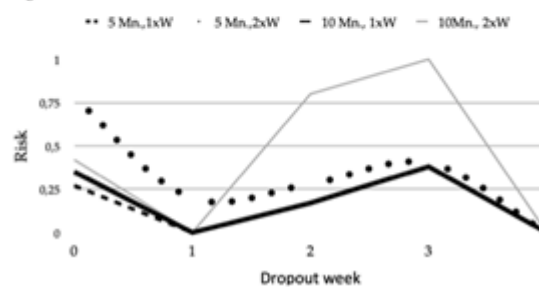


Fig. 4. Risk Function. Source: Authors' construction with results

Finally, the attrition risk function was analyzed for each factor group. According to [19], the risk function represents the probability per unit of time of presenting the episode in the following period. For all factor groups, the risk function is decreasing until week two, where it becomes increasing until week 3. Regarding the first week, the highest probability of dropout was found in factorial position three (5 Mn and 2 times per week) (75%), in the second week the factorial group four (10 Mn and twice a week) presented the highest risk of desertion (80%), in the third week a probability of 100% was also presented for the factor group four. The factorial position with the lowest weekly risk function presented throughout the four weeks was the factorial group two (10 Mn and once a week: (0%) for one, (13%) for both, (4%) for three and (0%) for four, Fig. 4. According to the Cox regression, no one variable of the selected was found associated with dropout. The verification stage was carried out in two steps; the first step is the results of the Pre-Test Po-Test and the second is the results of the control group. For the first step, analysis of the Pre-Test Post-Test, the average Initial Learning Level for the experimental group was  $M = 61.20$ ,  $SD = 4.28$  and the final Learning Level was  $M = 66.89$ ,  $SD = 5.56$ . The T test for related samples allowed to check whether or not there was a significant increase in the learning level of the participants. Results  $t(17, N = 44) = -3.89$ ,  $p < .05$ , indicate that the increase in the level of learning level is due to the design and training through podcast. For step (B) the control group was analyzed. The Pre-Test results show the average Learning Level of  $M = 66$ ,  $SD = 9.20$  and the Post-Test of  $M = 69.05$ ,  $SD = 7.20$ . The results of the related samples indicate that there are no differences between the two measurements  $t(13, N=11) = -2.03$ ,  $p = .135$ .

## 4 CONCLUSION

In the different studies that have been carried out on the acceptance of the podcast, the participants were mostly university students. Young people between 18 to 24 years old who was studying an undergraduate or a language course. Most of these studies were carried out in the educational sector, focusing mainly on medical and foreign lan-

gauge students. The researchers managed to establish that podcasts positively impact the field of education and change trends in distance and face-to-face education. Researchers have mostly focused their studies in the field of university education obtaining great results [10], [9], [12]. Unlike previous reviews, this article offered a clear definition of podcasts and their use in the educational sector, as well as pointing out a search criterion for specialized literature in the computing area implanted in the R environment. The results showed that each day is plus researchers who are interested in understanding podcasts and their relationship with learning more deeply, learning about their advantages and disadvantages in order to enhance their capacity and start using them in more areas of education. At the same time, another very important field is business, in which not many studies have been carried out on the impact that podcasts can have and how this tool could favor industries. This investigation analyzed in four different episodes of a Podcast, the influence of the factors of emission frequency and duration of the episode, on the percentage of student learning and dropout, according to the training on time management in a retail business. Each episode had a different combination according to the levels of each factor. The learning average of the factorial group with the highest percentage of learning was 5.2. and that of the control group was 3.20; evidenced that the treatment is more effective in 62%. The investigation showed that the design of the episode that has less probability of desertion is the group 2: 10 minutes, once a week every Monday. However, this result is contrary to what was found by [20], who established that the duration of the audios should be less than 10 minutes to avoid the participants losing attention on the audio; Perhaps this difference is due to the fact that this last Podcast was about learning English, where the variable repetition is important for learning. Regarding survival, the results reported that the group with the highest survival was also a group (2) with 45%. Likewise, during training, the week with the highest dropout risk for all factor groups was week three with (58%). It is important for future research to assess what additional factor is causing the increased dropout in the third week. The instrument used in the Pre Pos-test was a reliable instrument for the study with a cronbach's alpha of 0.78 for clarity and 0.88 for coherence. These Cronbach alpha values are a good indicator that allows us to establish that the measurement that was carried out through the questionnaire had a smaller measurement error because the test values for both clarity and coherence were close to 1. It was possible to know by means of exploratory factor analysis, the items of the four time management themes that really defined the construct and thus being able to design the questionnaires with the questions that really describe the time management themes. In addition, from the Colombia podcast database, it was possible to establish the appropriate launch days, according to the factors of frequency of use and duration of the episodes of each factorial group. Similarly, sufficient evidence was found to affirm that listeners who listen to an episode frequently once a week prefer that the release be on Fridays, and those who listen twice a week prefer that the release be on Tuesdays. Regarding the duration of the episode, listeners were found to prefer that episode lasting 10 minutes be released on Mondays and episodes of 5 minutes on Wednesdays. The previous statements are a new finding in the literature since

the relationship between the day of episode launching with the frequency of emission and duration of the episode had not yet been studied. Participants increased their learning level after completing time management training via podcast. The average of the total learning of the Post-Test increased by 3.72 points compared to the average of the total learning of the Pre-Test. To guarantee there was a real learning in the training, the Post-Test was performed 10 days after the end of the episodes. This assured that final answers were given due to learning and not memory, as was the case with the weekly questionnaires. This result established that Podcasts are a good training tool and people really learn through this medium. This result corroborates what was stated by [13], that podcasts are useful tools that increase the learning level. The proposed episode design consisting of treatment with the frequency of emission once a week and duration of 10 minutes per episode, improves the level of learning and reduces the risk of dropping out. It is recommended to continue conducting future research on increasing the level of learning through Podcast, in order to find more variables that may influence the level of learning of individuals. In first place, it is recommended to carry out this experiment with a sample of at least 50 individuals per factorial position so that the power changes to 0.96 with a moderate effect magnitude and thus to determine the associations or relationships that may exist between the learning level, duration of the episode and frequency of use. In this investigation, the reduction in company personnel due to the current situation of COVID-19 decreased the sample size and proved to be a limitation for these findings. And secondly, it is considered pertinent to study the influence of the gender factor of the announcer since, according to [21], gender could influence the level of learning in training through Podcast.

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