COMMUNICATION

EVALUATION OF A YOUTUBE CHANNEL FOR SCIENTIFIC DISCLOSURE ON AGRIBUSINESS

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ABSTRACT

This research analyzed the efficiency of a channel on the *YouTube* platform as a strategy for scientific dissemination and rural extension. The channel was created at the end of 2018 and the last video published in March 2021, totaling 58 videos. Through the metrics made available by *YouTube Analytics*, the information related to the channel, the audience, the searches on the platform and the engagement of the public were analyzed. Regarding the channel's metrics, an average of 15 minutes of total viewing duration, 144 subscriptions obtained and 8 lost. The audience metrics show that the channel has WhatsApp ©, Gmail ©, university website and Google © research as its main external sources. Furthermore, there is an audience, mostly female, Brazilian, between 18 and 24 years old, with access mainly by cell phone, computer and TV.

The channel searches were more relevant than those coming from the platform itself, in addition to direct or unknown origin, they had a longer average duration and hours watching, but a lower viewing rate. In the engagement, the use of the elements of the final screen was positive and more used after such confirmation, in addition, in the majority of the videos, they generated positive interactions with a majority of "I liked" instead of "I didn't like". We concluded, therefore, that in matters of scientific dissemination, the channel gained relevance when observing the growing metrics in relation to the public, while the rural extension also, however, with the participation of

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younger producers, requiring analyzes of how to reach the other age groups. Furthermore, it highlights the need for further research to understand better ways of engaging the public.

KEYWORDS: agrarian sciences, teaching, rural extension, livestock production, information and communication technology.

INTRODUCTION

Through technological instruments for the dissemination of information, Information and Communication Technologies (ICT) generate new patterns of interactions, evidencing their growth in education (SÁ, 2019). Technology has been increasingly inserted in projects with educational purposes, whether teaching, research and/or extension, these being the three pillars that consist of the functions of educational institutions. (OLIVEIRA; MOURA; SOUSA, 2015).

The extension is one of the fundamental pillars in the academic field. However, most scientific works that deal with the practice tend to approach the history of the extension and its insertion in the academic environment. Thus, there are few works that address the extension practice and how it can influence the formation of students and the way they contribute to the community (CASTRO, 2004). In this sense, scientific dissemination aims at broad information to the entire community, whether or not it is inserted in the academic environment. Scientific communication, on the other hand,

represents the exchange of knowledge between researchers and individuals involved in the theme (VALEIRO, PINHEIRO, 2008). In addition, such disclosure must guarantee the public reflection, criticism and contradictions on the topic addressed to form a society with a scientific culture (CALDAS, ZANVETTOR, 2014).

The YouTube video platform, created in 2005, had as its initial proposal the audiovisual sharing, except for films, television programs, video clips, amateur content, etc. With the wide access and evolution, the creators began to reflect on the content that integrated their site and with that, in 2008, they created YouTube Insight ,allowing registered users to have access to the statistics of their videos (CRUZ, 2008). According to Carvalho (2016), YouTube is a valid space for transmitting knowledge or recoding it for the lay public, after all, the platform allows the publication of different types of videos and content. Unlike traditional learning methods, YouTube has the advantage of being available at any time, in addition to providing the user with control over the pace of presentation (MATTAR *et al.*, 2019).

In the field of agribusiness, until 2019 there was not, among large channels, one that directly addressed animal production, from a professional perspective (SILVA, 2019*)*. After 2019, new channels were created with the aim of disseminating science, thus showing that more and more the public inserted in Agricultural Sciences has worked to expand knowledge beyond

academia. The Agricultural Sciences channels have low percentages of participation on YouTube, as well as they have a lower number of subscribers and views compared to other areas, even though there are more videos published than in Applied Social Sciences (BUENO, 2020). Therefore, this work aims to analyze the efficiency of a channel as a means for scientific dissemination and rural extension for Agribusiness through the creation, availability, and dissemination of content relevant to the theme on the YouTube platform.

MATERIAL AND METHODS

To create a YouTube channel, a Google© account was needed. Thus, an account was created and then the login was carried out on the platform, and access to the link "create a channel", available on the user's profile page. When the user does not have an account on the Google © platform, it is requested to create it, for later elaboration of the channel. The channel creation process encompassed the choice of its user, basic information, and a visual identity, be it a personal photo or logo creation.

The creation of videos for the channel analyzed in this study took place through recording equipment, as well as programs for editing and compiling the contents. All and any participation were carried out with the image authorization of the collaborators for the validation of permission to use. In addition, it was established that there is no remuneration for the participation of

employees, and all the content created had the sole purpose of scientific dissemination. During the research, adaptations were necessary due to the Covid-19 pandemic, and as of 2020 there were no more face-to-face recordings with employees, and the videos published from this period onward were recorded remotely.

The elaborated channel had 58 publications, the first on December 11, 2018, and the last on March 20, 2021. The analysis performed was of all content with an addition of 7 days after the last publication in order to obtain a minimum period for verifying the performance of the last content, allowing the analysis of each video. For better efficiency in scientific dissemination, all videos were released on the social networks of the Laboratory of Agribusiness Studies (LEA), such as the website and Instagram©. When in events in partnership with other institutions, dissemination was carried out through websites, Instagram©, email and WhatsApp©.

Some studies on the use of YouTube were carried out through the platform itself, in which users shared effective experiences for better growth of a channel, including the Creator Academy itself, a platform made available for conducting courses for content creators. Therefore, throughout the research, aspects such as tags, thumbnails and titles were adjusted to attract the audience that already exists on the platform. It should be noted that the improvements were adopted not only in new videos, but also in content already available and that presented better performance. Such a method

was adopted to analyze the capacity of these tools for greater reach.

To analyze the channel statistics, YouTube Studio was used, a tool available for content creators. In the "statistics" tab, when using the advanced mode, it was possible to obtain a complete analysis for pre-established periods. The metrics selected for evaluation were divided into four groups, referring to the channel, the audience, searches on the platform and audience engagement.

Metrics related to the channel were: i) Display time (time dedicated by the public to the contents); ii) Channel views (total views, where the same user can count more than once); iii) Average viewing duration (average time spent by the audience watching the content); and iv) Subscriptions to the channel.

Regarding audience metrics, the following were selected: i) Unique viewers (in the last 90 days); ii) Gender, age, and country; and iii) Devices (means of access to the channel).

As for YouTube's search metrics: i) Impressions and click-through rates (related to thumbnails and how many were clicked) and ii) Traffic origin (how the audience arrives at the content). In addition to these, engagement metrics were selected to analyze the relevance of the content by the audience, which were: i) I liked, and I didn't like it (fastest form of interaction); ii) Clicks on the card (content suggestions); iii) Comments (questions and feedback that may exist); and iv) Sharing (if the audience sent the content to more people).

RESULTS AND DISCUSSION

CHANNEL AND CONTENT CREATION

For the research, an account and a user were created on Google©. As it is not a personal channel, a visual identity was established that would refer to the standard colors of LEA. Subsequently, the compilation of contents was carried out, which required planning of relevant issues for Agribusiness, as well as communication with professionals in the area for a prior invitation to participate. Contributors who agreed to participate in the channel signed a term of authorization for the use of the image and the dissemination of the material, which had the sole and exclusive purpose of teaching, research, and dissemination of scientific knowledge. The participants received no remuneration and signed the term without any burden or restrictions. The recordings proceeded with the creation of a script, together with the collaborator of each video.

For image and sound capture, Digital Single Lens Reflex (DSLR) cameras, camcorders, tripods, and cell phones were used. Due to the Covid-19 pandemic in 2020, adaptations were necessary, as it was not safe for authors and collaborators to meet for external and in-person recordings. In this way, the collaborators were instructed to film and capture their audio, in order to continue the project. Partnerships were also made for recording online events such as lives, courses, and symposia. The partnerships made and recorded proved to be relevant, as they allowed the public to view

the content even after the event was over and through any device.

All recorded materials (videos and audios) were audited, organized, and reviewed using the Adobe Premiere platform. Once finalized, the material was sent to YouTube and made available to the contributor for approval. At this stage, it was also necessary to create a thumbnail for YouTube, corresponding to the cover to be viewed in each video, and for this, the Canva® platform was used to create visual materials.

To upload the videos, it was necessary to insert some information such as title, description, tags, among others, and for that, some strategies were thought to increase the reach of the material to be published. The titles, for example, were short, direct and eye-catching, as it was the first thing noticed by the public, therefore, it should arise interest. The description had a limit of 5000 characters, where it was necessary to inform in more detail the content to be found in the video. Other items, such as playlist, final screen, cards and visibility were used in order to organize the channel, as they allow the separation and categorization of content. It was also possible to choose the visibility of the video, which, when not listed, allows only viewers who have the link to view the content, a useful tool for holding events with subscriptions, for example, in which the video does not appear on the profile, in which viewers who have the link can watch it.

In addition, rating information (age) was specified at the time of upload on the platform, in order to restrict the content, when necessary. YouTube also offers the option to select the audience by country of origin and language, allowing the option of subtitles for greater reach. After all the adjustments and approval by the contributor, each material could be published.

CONTENT DISCLOSURE

At first, the dissemination of content took place through sharing on social networks, WhatsApp© and mailings from employees and partners, as well as on the LEA website. During the experiment, there was a need to create a wide-ranging social network for the laboratory, for the first-hand dissemination of the material developed. Thus, an Instagram© account was created. Another important means of scientific dissemination were partnerships with entities and major events in the area. They were held from lives in partnership with course coordinators to answer students' doubts, to courses and events, which were later made available beyond the registered public, increasing their reach and accessibility.

Throughout the research, the content dissemination processes on the platform were refined and improved. The authors took Creator Academy courses as well as consumed content related to improving the availability of videos on YouTube, to increase the engagement of videos and learn techniques to make them stand out within the platform, appearing in the first searches and being nominated, for through prints, for people with that interest. In this sense, tags were used, which work as keywords to increase the reach of the

videos and allow the observation of content like those already available on the platform.

Furthermore, these studies demonstrated the meaning of prints and how they are related to both thumbnails and titles. For this reason, throughout the research, the titles of the videos were improved, using strategic words related to the content and easy to understand for the public, so that the content would serve both professionals and personnel in the area, as well as laymen. Regarding thumbnails, it is important to emphasize the need to be eye-catching in order to arise curiosity in the public so that a higher click-through rate (CTR) occurs. In this sense, questions or keywords were used to instigate the public's curiosity, associated with images that referred to the theme of the video in question.

CHANNEL AND AUDIENCE ANALYSIS

In addition to providing channel statistics on the platform, YouTube also allows for individual and/or comparative analysis of videos. For the present work, several general metrics of the channel were used, as well as the evaluation of the individual performance of the five (5) best videos of the channel. In Table 1 it is possible to observe the channel (MC) and engagement (ME) metrics.

Table 1. Channel analytics and engagement.

Channel analytics				
Watch time (hours)	Views	Average view length	Subscribers lost	Subscribers obtained
871.562	3,397	00:15:23	8	144
Engagement analytics				
Dislikes	Likes	End screen element clicks	Comments added	Shares
2	268	19	61	78

Source: Research data.

The live videos got more views and watch time, but over time other videos gained more prominence and improved their views compared to the live ones. The average duration of total views of the channel is highlighted here, which must be analyzed separately for each type of content, since, according to Gelli (2021), this information, together with its percentage, can make the videos more publicized by the platform itself. However, YouTubers claim that this criterion differs for long videos and/or lives content present on the channel. Therefore, when analyzing the average length of some videos, we see a rate that varies from 20% to 50%.

In the data obtained by MC, there is a gain of 144 and a loss of 8 subscribers, however, such metrics do not provide sufficient information, as they are not always related to a video itself. Meanwhile, in engagement, it was observed that the cards were not used by the public, however there was greater interaction with the elements of the final screen. The cards were used to direct the audience to similar content existing on the channel, in order to increase the audience's permanence in the videos, howe-

ver, they did not generate interactions. The final screen demonstrated an effective action for audience retention.

During most of the research, audience interactions were positive, through "I liked" tags, which represented 99.25% of the total interactions, with the remaining 0.75% referring to the "I didn't like" interaction. Another variable to understand the metrics are the comments, which were mostly from the live events. However, praise, doubts and su-

ggestions were also obtained from the channel's audience for improvements on future occasions. Such data highlights the importance of this space for interaction between the public and content creators and serve as a subsidy for analysis of engagement for future improvements in content and approach. Table 2 shows the search metrics (MB). MB allows analysis of audience origin and allows correlation with MC, along with impressions and CTR.

Table 2. Channel search metrics

Traffic source	Views	Watch time (hours)	Average view length	Impressions	Impressions click-trough rate (%)
Total	**3,397**	**871.562**	**00:15:23**	**45,552**	**3.03**
YouTube search	806	74.150	00:05:31	32,686	2.06
External	746	201.849	00:16:14		
Direct or unknown origin	464	347.935	00:44:59	.	.
Channel pages	362	28.259	00:04:41	6,229	3.9
Playlists	220	39.505	00:10:46	1,059	13.22
Browse features	208	73.139	00:21:05	2,065	4.84
Suggested videos	208	30.013	00:08:39	2,613	4.59
Playlist page	176	17.743	00:06:02	900	11.78
Other YouTube features	134	48.155	00:21:33	.	.
Notifications	53	6.990	00:07:54	.	.
End screens	20	3.826	00:11:28	.	.

Source: Research data.

You can see a large number of views from searches on the platform, added to many impressions. However, such views have low CTR, showing that despite high impression, it arises little interest in the public. The direct or unknown origin of the MB is the one coming from the video URL, favorites or even applications not recognized by the platform. In this source, the highest average viewing duration and

viewing time were detected, but a lower viewing rate.

In terms of external sources, the majority of the public came from WhatsApp©, Gmail©, University websites and Google© research, demonstrating wide dissemination and demand for content in media beyond the standard public of the LEA and the Federal University of Uberlândia. Other important sources were the channel pages, with high

impressions, and playlists, with emphasis on viewing time and CTR.

Table 3 indicates the audience metrics, where it is possible to observe a larger female audience, between 18 and 24 years of age of Brazilian nationality. In this sense, the participation was of a younger audience, in which producers can be inserted. Regarding access, cell phones were the most used, however when accessed by computer, TV and game console, viewers spent more time viewing the content.

Table 3. Channel audience metrics

Viewer gender	Views (%)	Average viewed (%)
Female	61.21	23.12
Male	38.79	18.68
Viewer age	**Views (%)**	**Average viewed (%)**
18 - 24 years old	60.61	19.16
25 – 34 years old	39.39	18.50
Device type	**Views**	**View length average**
Mobile phone	1,642	0:08:32
Computer	1,449	0:22:43
TV	138	0:25:27
Tablet	38	0:11:42
Game console	5	0:30:02

Source: Research data.

The best performing videos were analyzed according to the number of unique viewers, as shown in Table 4. This criterion allows verifying the actual number of users who watched such videos, since the number of views may correspond to more than once per viewer, as indicated by the fact that there are more views than the total number of viewers. The themes of these contents were varied, as well as their origin (lectures from in-person and online events, and video produced exclusively for the channel).

Table 4. Metrics of the five most viewed videos on the channel.

	Watch time (hours)	Views	Unique viewers	Average views per viewer	Impressions	Impressions click-through rate (%)
Sheep-farming production costs – I JAPER	17.981	89	68	1.309	957	5.54
Protected fat for ruminants – I JAPER	7.687	65	54	1.204	1,050	4.57
Animal production and sustainability - V SISCA	7.522	62	53	1.170	964	0.93
Artificial and natural shading for livestock - Part 1	1.375	38	35	1.086	636	5.19
Life cycle assessment – V SISCA	1.710	21	11	1.909	381	2.62

Source: Research data.

CONCLUSION

In the present study, it was possible to verify the existence of an audience interested in the theme of Agribusiness and that seeks quick and easy information through YouTube. In addition, it was also possible to verify the importance of using ICTs for scientific dissemination, to expand access to knowledge. In terms of rural extension, the participation of younger producers was considered, a fact demonstrated by the age of the spectators, requiring improvements to reach the other age groups and communication with this audience. In short, this research demands continuity for a better understanding of the forms of engagement with the public, as well as in relation to the duration and retention of views for a better understanding of the themes and anxieties of the spectators.

AVALIAÇÃO DE UM CANAL NO YOUTUBE PARA DIVULGAÇÃO CIENTÍFICA DE ASSUNTOS RELACIONADOS AO AGRONEGÓCIO

Resumo: Esta pesquisa analisou a eficiência de um canal na plataforma YouTube como estratégia para divulgação científica e extensão rural. O canal foi criado no final de 2018 e o último vídeo publicado em março de 2021, totalizando 58 vídeos. Por meio das métricas disponibilizadas pelo YouTube Analytics, foram analisadas informações referentes ao canal, audiência, buscas na plataforma e engajamento do público. Em relação às métricas do canal, obteve-se uma média de 15 minutos de duração da visualização total. As métricas de audiência mostraram que as principais origens externas do canal são o WhatsApp©, Gmail©, sites universitários e a pesquisa do Google©. Constata-se um público majoritariamente feminino, brasileiro, entre os 18 e 24 anos de idade, com acesso principalmente pelo celular, computador e TV. As buscas do canal tiveram maior relevância em comparação àquelas oriundas da própria plataforma, além de origem direta ou desconhecida e apresentaram maior duração média e horas assistidas, porém, menor taxa de visualização. No engajamento, a utilização dos elementos da tela final foi positiva e mais utilizada após tal constatação, além disso em sua maioria os vídeos geraram interações positivas com uma maioria de "Gostei". Conclui-se, portanto, que em questões de divulgação científica o canal obteve relevância ao constatar as crescentes métricas em relação ao público. Quanto à extensão rural, foram atingidos principalmente produtores jovens, necessitando análises de como atingir as demais faixas etárias. Ademais, ressalta-se a importância de continuidade da pesquisa para entender melhores formas de engajamento do público.

PALAVRAS-CHAVE: ciências agrárias, ensino, extensão rural, produção animal, tecnologia da informação e comunicação.

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