

DEPARTMENT OF STATISTICS UNIVERSITY OF COLOMBO

IS 3005

Statistics In Practice 1

A study on YouTube Usage for Educational Purposes by Undergraduates of Universities Located in Western Province

Group members-B

s14487- Nimshani T. D. A.

s14357- Nuwanjalee W. A. M.

s14383- Weerasinghe H. S. H. A.

s14429- Fernando M. R. N.

s14379- Sri J. M. D. M. J.

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2. Executive summary

YouTube is an American online video sharing and social media platform owned by Google which is operating since 2005. It is the second most visited website after Google, with more than one billion monthly users who watch more than one billion hours of videos each day. Wide range of video categories are available on YouTube such as music videos, video clips, news, short films, documentaries, feature films, audio recordings, movie trailers, teasers, live streams, vlogs and many more.

YouTube is also the go-to browser of many university students when they come up with difficulties in their academic work and also a place to relax, relieve stress and explore exciting things. So, the main purpose of this study is to observe and elaborate how YouTube is used for educational purposes by undergraduates in Universities of Western province. A questionnaire was designed to gather required information about how YouTube helps undergraduates with their studies. Though the questionnaire had many variables to observe various effects of YouTube on University students' education only a handful was selected to carry out the analysis in a much descriptive way.

Not all undergraduates in universities of western province use YouTube for educational purposes. It was confirmed more from the responses from the questionnaire as there were 24 out of 152 who don't use YouTube for educational purposes. Since majority was wise versa, it was necessary to look for which educational purposes they use YouTube for. As included in the questionnaire those purposes were briefly stated as to cover missed areas in subjects, to find a solution to an academic question, to

self-learn a difficult part, to recall some parts of a lecture and to learn something completely new. Through the analysis it was evident that most undergraduates use YouTube for self-learning as the syllabuses are broad and only handful is taught at lectures. So, there are many things for a student to search and learn by themselves. Next it was necessary to check how field of study of an undergraduate varies with the YouTube channels they prefer. It is obvious that YouTube channel changes with one's field of study but there are many educational YouTube channels covering a wide range of subjects. It was evident that Khan Academy, Free Code Camp and MIT open Course ware are the most preferred channels by undergraduates following Physical science, Engineering and IT. Among them Khan Academy outbursts others.

As University students we tend to look forward to the profession of a content creator before selecting a video to watch in order to learn something from the best. But there are also students who don't care such matters. Respondents Rank 1 went for University lectures mostly while Rank 2 was for Industrial Experts when selecting an educational video. Some common features of a YouTube video like number of views, public comments, number of subscribers, name and nationality of a content creator and thumbnail of a video was analysed against the fact of selecting a video to watch. Humans are fascinating creatures of nature with varying choices. Similar variation was observed on how undergraduates selected their educational videos. Many were concerned about name of the content creator while least for number of subscribers.

When considering an educational video, there are many types of them consisting examples, animations, lectures, simulations, laboratory experiments and much more. And students check for duration of a video before watching it. But it was observed that there is no relationship between type of the video and time duration of an educational video. Not only for education YouTube is also used by students as a way of keeping them focussed on studies with the help of motivational videos/non-educational videos or listening music. It was interesting to check which method affects most and majority of our respondents voted for listening to music while studying while most watched motivational videos only when they don't feel like studying. This study is very much exciting as it revolves around non-other but YouTube usage of University students

3. Introduction

3.1 Outline

YouTube is one of the most popular social media platforms in the world right now. Its versatility has also made it one of the mostly used learning platforms because it has opened up new forms of learning in a world where education is becoming more digitized. It is easy to access, easy to incorporate and encourages online discussion over educational topics. It can be accessed all over the world. The only need is stable and reliable internet connection and device to browse on YouTube. It is also available in all languages and offers applications for both blind and deaf students. Furthermore, YouTube can be accessed on a multitude of devices. It is a resource that can be used whenever and wherever. Since self-learning has become a much bigger part in students' lives over past 2 years with the global pandemic, YouTube has become even more popular among students; specially university students. This study was focused on different attributes of you tube usage of university students when it comes to educational purposes. The overall objective is to observe the effect of YouTube on university students' education.

In the process of primary data analysis, a questionnaire was designed first. Since the limitation of time and the resources available, information was gathered from the undergraduates of university students in western province of Sri Lanka. Results were obtained by focusing several objectives that we made.

3.2 Data

Target Population: The undergraduates of universities located in the Western Province of Sri Lanka.

- 152 responses were collected through an online google form.
- There were two questions in the google form; whether YouTube is used for educational purposes or not and whether the student is in a university located in western province or not. If at least one of the above respondents said "NO", form was submitted without letting go ahead. Therefore, there were only 128 responses to perform our analysis.

Variable	Description	Data type
Field_of_study	Field of study	Categorical
Fields_that_use_ytb	Fields that mostly use YouTube for when it comes to educational purposes	Categorical
Purposes_that_ytb_used_for	Purpose(s) that mostly use educational videos in YouTube	Categorical
Having_Impact_of_the_POV	Having an impact of the presenter of the video.	Categorical

Professions_of_CC_Rank_1	Profession of the content creator being the most preferred rank as 1	Categorical
Favourite_chnls_relevant_SA	Favourite/recommended channel(s) for relevant subject area.	Categorical
MP_video_type_under_SA_R1	Type of videos which mostly prefer to watch under a certain subject area being the most preferred as rank 1.	Categorical
Avg_time_duration	Average time duration of the selected video to be.	Categorical
Nationality_impact_of_YCC	Impact of the nationality of the content creator when it comes to selecting a video from a list of search results.	Categorical
Views_impact_when_searching	Impact of the number of views a certain video has, when it comes to selecting a video from a list of search results.	Categorical
Impact_of_NameOf_YCC	Impact of the name of a content creator of a certain video, when it comes to selecting a video from a list of search results.	Categorical
Impact_of_PSbs	Impact of the number of subscribers a certain content creator has, when it comes to selecting a video from a list of search results.	Categorical
Impact_of_PComments	Impact of taking the nature of the public comments of a certain video before committing to watch the video in full.	Categorical
Impact_of_Thumbnails	Impact of the thumbnail of a video when it comes to selecting a video from a list of search results.	Categorical
Watching_Mot_non_Edu_Videos	Watching motivational or any other kind of non-educational videos to help keep yourselves focused on the studies	Categorical
Listening_YMusic_when_studying	Listening to music or any other kind of background audio via YouTube while study, to help yourselves focus better.	Categorical

Analysis was done by using an Excel sheet which was generated in questionnaire. [\[Annexures-2\]](#).

3.3 Data source

Data was taken by the designed questionnaire. [\[Annexures-1\]](#)

3.4 Data Pre-processing

- First, 128 responses who use YouTube for educational purposes and study in universities located in western province were selected among 152 responses. Other 24 responses were removed from the dataset.

- As mentioned in the questionnaire, if someone respond as “Yes” only to the 10th question, 11th question will appear. Due to a technical error, those who gave respond as “No”, 11th question was also got. Therefore, the answers for the 11th question person who responded as “No” was deleted from dataset also.
- And there were some missing values in the dataset. So, the mode of that relevant variable was added as the missing value.
- From 20th to 25th questions were recoded. Below table shows how variables were recoded.

Question Number	Answer	Recoded Answer
20	It's better if it's a native English speaker	High Impact
	I don't mind as long as it's clear and understandable	Medium Impact
	It doesn't bother me at all	Low or no Impact
21	Yes, I always tend to select a video with a higher number of views out of the search results.	High Impact
	Yes, sometimes I take that into consideration.	Medium Impact
	I don't care about the number of views at all.	Low or no Impact
22	Both of the above	High Impact
	Yes, I feel comfortable choosing a video from a content creator that I'm already familiar with / Yes, I prefer a content creator with a name related to the subject I'm working on.	Medium Impact
	I don't care about the name of the channel at all.	Low or no Impact
23	Yes, I always tend to select a video from a creator with a higher number of subscribers.	High Impact
	Yes, sometimes I take that into consideration.	Medium Impact
	I don't care about the number of subscribers at all.	Low or no Impact
24	Yes, I always check the comments before committing to watch in full.	High Impact
	Yes, sometimes.	Medium Impact
	I don't care about the nature of comments at all.	Low or no Impact
25	Yes, I always tend to select a video with a better looking thumbnail.	High Impact
	Yes, sometimes.	Medium Impact
	I don't judge videos by the thumbnail.	Low or no Impact

3.5 Methodology

- YouTube usage for educational purposes of Undergraduates of universities in western province was selected as the study after discussing with group members.
- Only the undergraduates of universities located in the Western Province of Sri Lanka were selected as target population.
- Questionnaire was designed using google forms.
- Questionnaire was presented to the lecturers to get feedbacks about questionnaire.
- After questionnaire presentation, some questions were changed according to the feedbacks given by the lecturers.
- Questionnaire was distributed among the individuals using WhatsApp as an online survey.
- Data were collected from all the respondents during the allocated data collection period.
- Responses were viewed in excel sheets and unusual data points such as missing values were identified.
- Data were pre-processed using data cleaning techniques before conducting the analysis.
- Objectives were created and clearly identified after discussing with group members.
- Analysis was done using excel and SPSS software.
- Finally, the report was prepared by the group members.

3.6 Objectives

Our main objective was to observe the effect of YouTube on university student's education. For the ease of analysis, objectives were divided into some parts as follows.

1. Analysis of YouTube usage on educational purposes by undergraduates.
2. Analysis of the Impact of the field of study of an undergraduate of their preferred YouTube channel.
3. Impact of profession of YouTube content creator preferred by undergraduate on selecting an educational video.
4. Impact of name of the content creator, nationality of content creator, number of views, number of subscribers, public comments, and thumbnail of a video on selecting an educational video to watch.
5. Association between preferred average time duration of a video and most preferred type of a video
6. Impact of watching motivational videos or any other non-educational videos and listening to music while studying on focusing on studies.

4. Analysis

4.1 Analysis of educational purposes of YouTube usage by undergraduates.

Table 1: Frequency table of main purposes

		Frequency	Percent
1. To cover missed areas in subjects	no	57	44.5
	yes	71	55.5
2. To find a solution for an academic question	no	29	22.7
	yes	99	77.3
3. To self-learn a difficult part of a subject	no	14	10.9
	yes	114	89.1
4. To study recall some parts of a subject faster	no	97	75.8
	yes	31	24.2
5. To learn something completely new	no	59	46.1
	yes	69	53.9

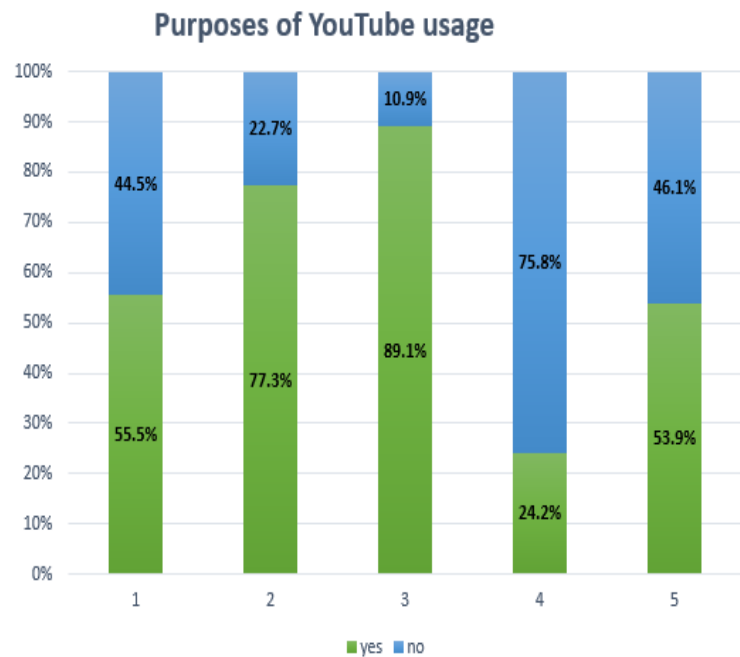


Figure 1: Stacked bar chart of purposes of YouTube usage

YouTube is used by undergraduates for educational purposes. Such as mainly to cover missed areas in subjects, to find a solution for and academic question, to self-learn a difficult part of a subject, to study recall some parts of a subject faster and to learn something completely new. In this case, through our analysis it can be clearly seen that majority which is 89.1% of undergraduate students at universities in western province have used YouTube to self-learn a difficult part of a subject. Second highest percentage is 77.3% which is to find a solution for an academic question. And YouTube is least used by students for educational purposes to study and recall some parts of a subject faster.

4.2 Analysis of the Impact of the field of study of an undergraduate of their preferred YouTube channel.

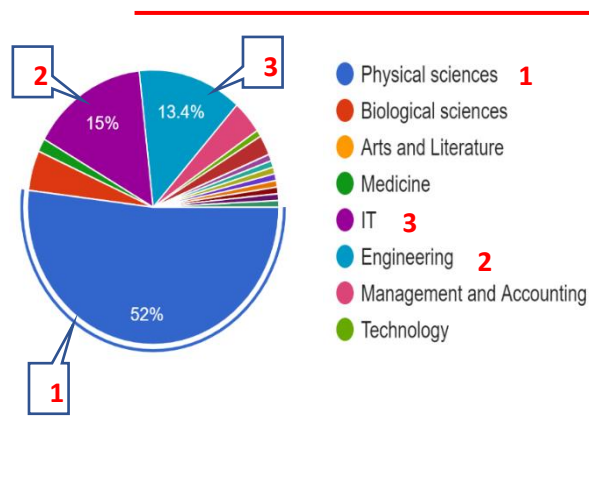


Figure 2: Pie chart of field of studies

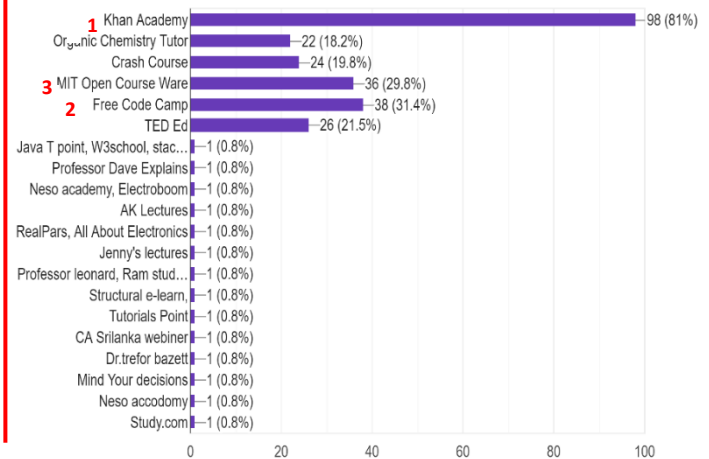


Figure 3: bar chart of YouTube channels

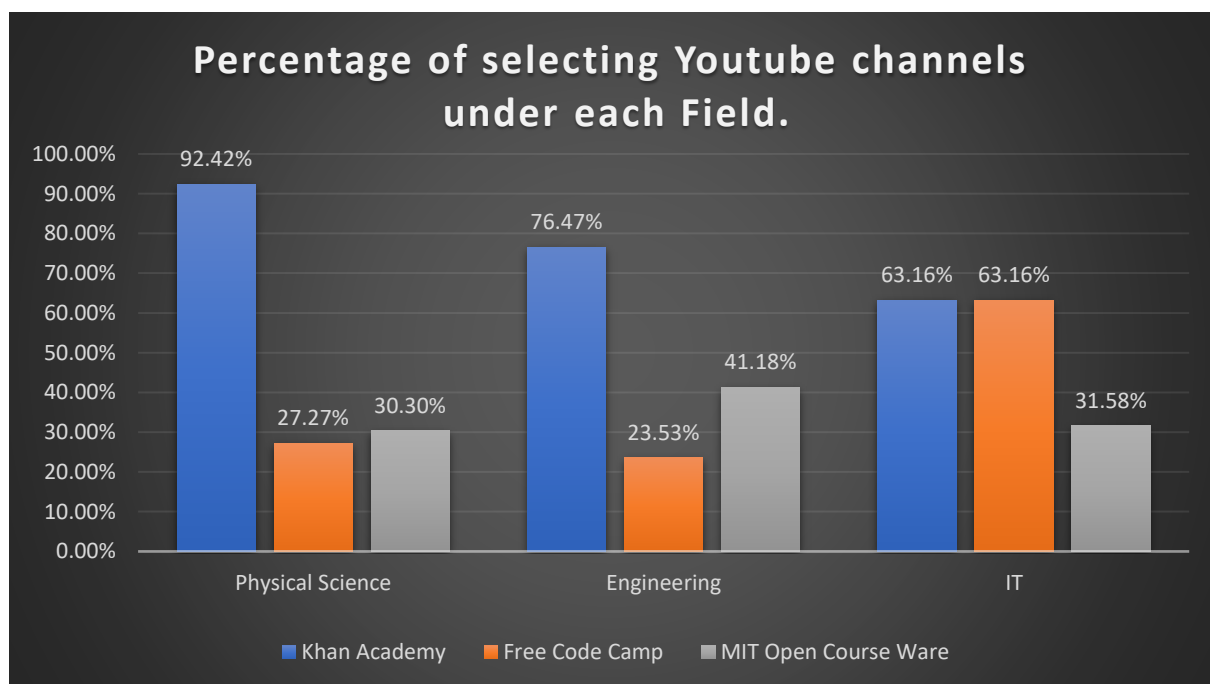


Figure 2: Multiple bar chart of YouTube channels with each field

When analysing a dataset instead of focusing on minority responses it is better to focus on majority to get better results and conclusions. So as in our pie chart, mostly followed field of studies by our respondents are physical science, Engineering and IT. And mostly preferred YouTube channels by them are Khan Academy, Free Code Camp and MIT Open Course Ware. We analysed how YouTube channels are preferred by our respondents on each field of study mentioned above. It is observed that YouTube channel Khan Academy is mostly preferred by all three field of studies. When considering individually, secondly most preferred YouTube channel by physical science and engineering undergraduates is MIT

Open Course Ware but IT undergraduates prefer Khan Academy and Free Code Camp YouTube channels equally for educational purposes.

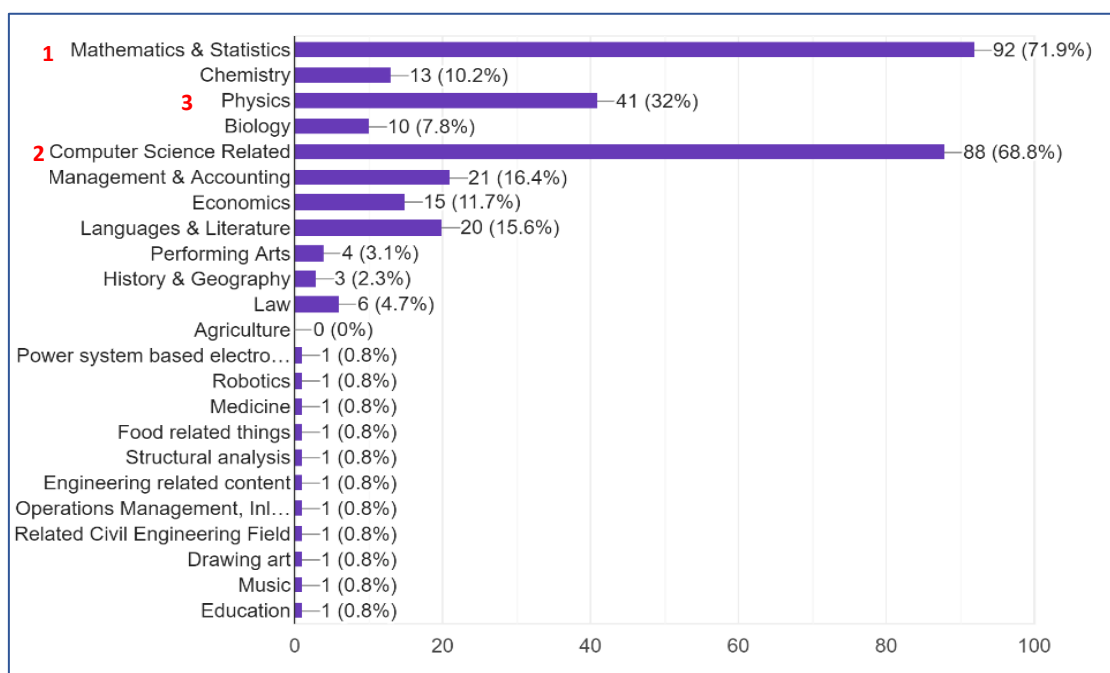


Figure 3: Responses vs subject areas

Next, we are interested in analysing the distribution of subject area with the most preferred YouTube channel. So, the subject areas under most followed field of study by our respondents, Physical science is used here to analyse how those students use Khan Academy for their relevant subject areas such as Mathematics and Statistics, Physics and Computer science related. There are 61 physical science students who prefer Khan Academy YouTube channel and distribution of them with the most followed three subject areas are as follows. Here subject areas are considered individually even the respondent could select multiple choices.

Table 2: Frequency of Physical Science students who uses Khan academy for a particular subject area.

	Counts
Physical Sciences who use Khan academy for Mathematics and Statistics	21
Physical Sciences who use Khan academy for Computer science related	15
Physical Sciences who use Khan academy for Physics	5

So, mathematics and statistics undergraduates are the ones who use Khan Academy for their academic activities when referring educational videos on YouTube.

4.3 Impact of profession of YouTube content creator preferred by undergraduate on selecting an educational video.

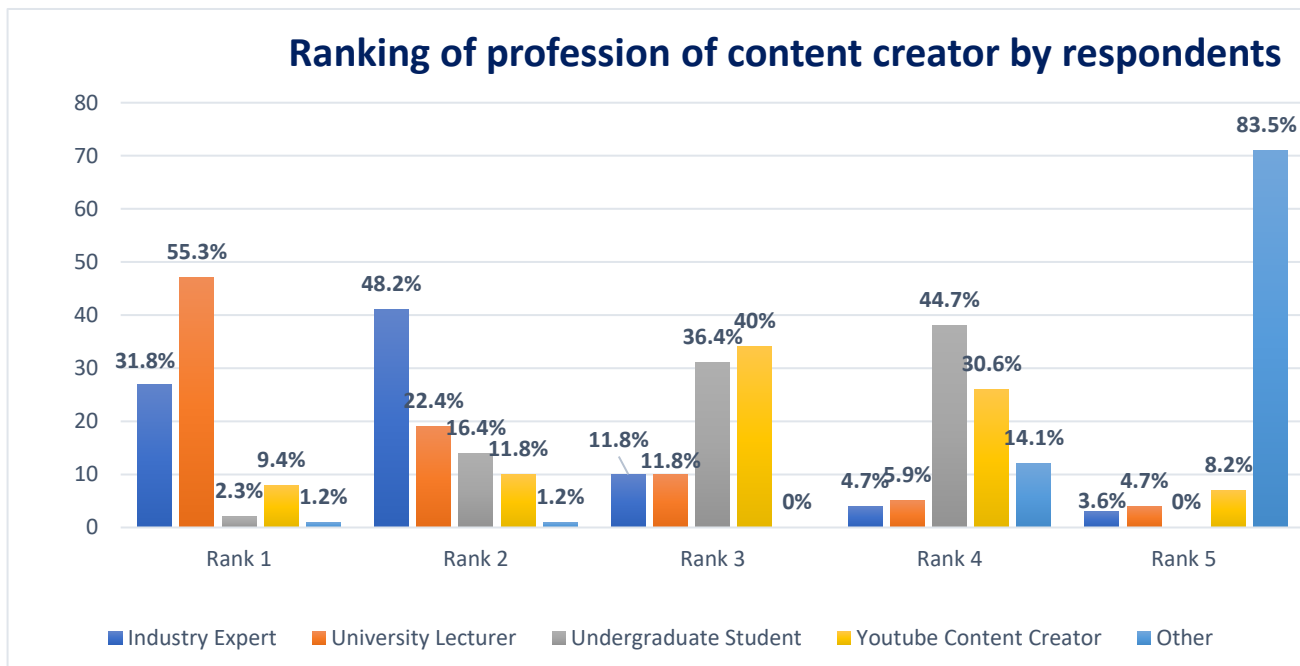


Figure 4: Percentage bar chart of ranking of profession of content creator by respondents

It was necessary to check whether undergraduates of universities in western province considered about profession of content creator when selecting an educational video on YouTube. So, 85 of the respondents out of 128 have considered about profession of the content creator when selecting an educational video. They have ranked the most preferred professions as above.

Highest voted profession of rank one is university lecturer. Industry expert is voted as the second highest and YouTube content creator is voted as the third highest profession. So, undergraduates in universities of western province mostly prefer to learn under university lecturers and industrial experts for educational purposes on YouTube.

4.4 Impact of name of the content creator, nationality of content creator, number of views, number of subscribers, public comments, and thumbnail of a video on selecting an educational video to watch.

Table 3: Table of impact on several features of a YouTube video

128	Nationality	No. of Views	Content creator name	No. of Subscribers	Public comments	Thumbnails
High Impact	26%	20%	30%	16%	19%	17%
Medium Impact	57%	57%	36%	37%	58%	60%
Low or No Impact	17%	23%	34%	48%	23%	23%

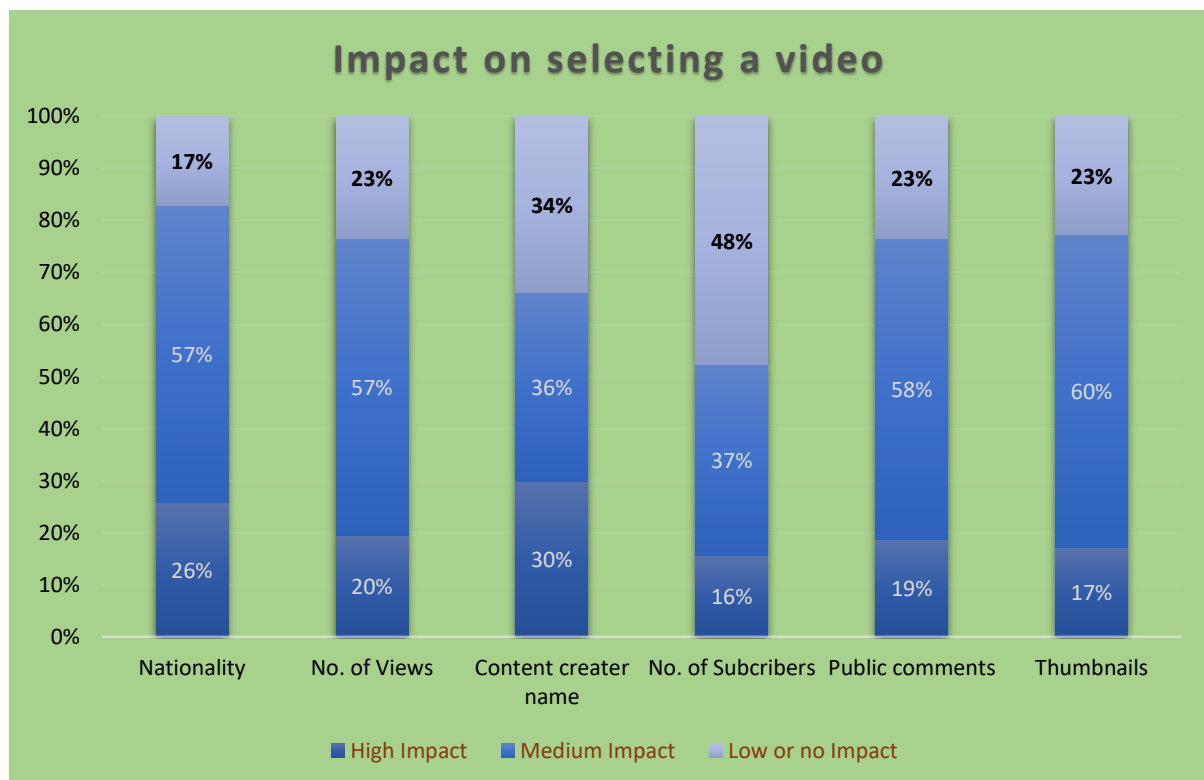


Figure 5: Stacked bar chart of impact on several features of YouTube on selecting a video

To measure the impact, we recoded the given choices under three levels of impact. They are High impact, medium impact and low or no impact.

When considering nationality, most responses are for medium impact which is they don't mind the nationality of the content creator as long as it is clear and understandable when selecting an

educational video on YouTube. Most undergraduates sometimes consider about number of views of an educational video and also name of the content creator related to a certain subject area is considered by undergraduates of universities in western province when selecting an educational video. When considering about number of subscribers there is a low impact of selecting a video with certain number of subscribers. Public comments and thumbnails are only considered sometimes by majority of the respondents. By considering all six aspects, highest impact is for content creator's name and lowest impact is for number of subscribers of a video.

4.5 Association between preferred average time duration of a video and most preferred type of a video

Average time duration of a video is chosen from less than 5 minutes, 5 to 10 minutes, 10 to 15 minutes and more than 15 minutes by respondents while preferred type of a video is chosen from "a tutorial with solved examples", "Animated explainers", "Laboratory experiments", "Lectures", "Real world applications", "Simulations" and "video with embedded subtitles". When ranking a type of a video, since rank one is used to vote for most preferred. To check the association between preferred average time duration of a video and most preferred type of a video, here we have considered the responses of rank 1 only.

Table 4: Crosstabulation of type of the video vs duration of the video

		Duration				Total
		10 - 15 mins	5 - 10 mins	Less than 5 mins	More than 15 mins	
Type	A tutorial with solved examples	52	24	8	10	94
	Animated explainers	7	10	2	0	19
	Laboratory experiments	1	0	0	0	1
	Lectures	1	1	1	1	4
	Real world applications	3	3	0	2	8
	Simulations	0	1	0	1	2
Total		64	39	11	14	128

Chi square test for association is used. And hypotheses are as follows.

H_0 : There is no relationship between preferred average time duration and preferred type of a video

H_1 : There is a relationship between preferred average time duration and preferred type of a video

Table 5: Chi-Square test results

Pearson Chi-Square	17.415 ^a	15	.295	.301
Likelihood Ratio	19.037	15	.212	.196
Fisher's Exact Test	19.370			.098
N of Valid Cases	128			
a. 18 cells (75.0%) have expected count less than 5. The minimum expected count is .09.				

Since there are many expected values less than five, Fisher's exact test is used here.

As P value 0.098 is greater than 0.05 significance level, we do not reject H_0 at 5% significance level. Therefore, there is no relationship between preferred average time duration and preferred type of a video.

4.6 Impact of watching motivational videos or any other non-educational videos and listening to music while studying on focusing on studies

There are many methods used by students to help keep them focus on study. In our analysis, the methods we considered are watching motivational videos or any other non-educational videos on YouTube and listening to music on YouTube while studying.

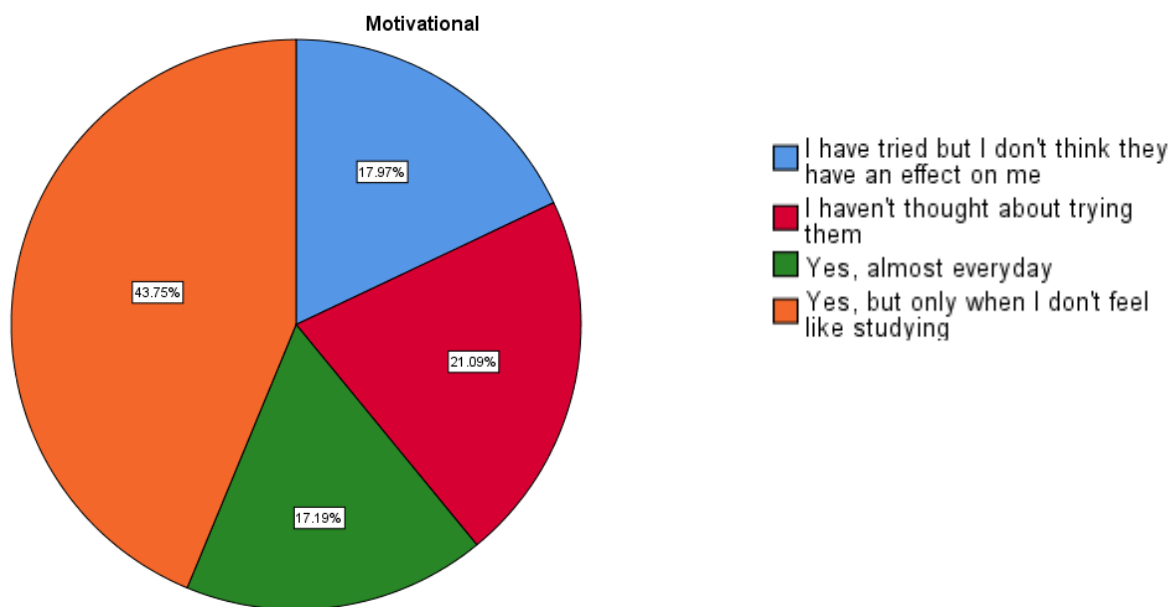


Figure 6: Pie chart of watching motivational videos

When considering about responses of our respondents' majority of them are watching motivational videos only when they don't feel like studying. And many students haven't thought about watching motivational videos to help keep them focused on studies. And only 17.19% of respondents watch them almost every day. 21.09% of respondents haven't thought about trying motivational videos and 17.97% of them think there is any effect on focusing on studies.

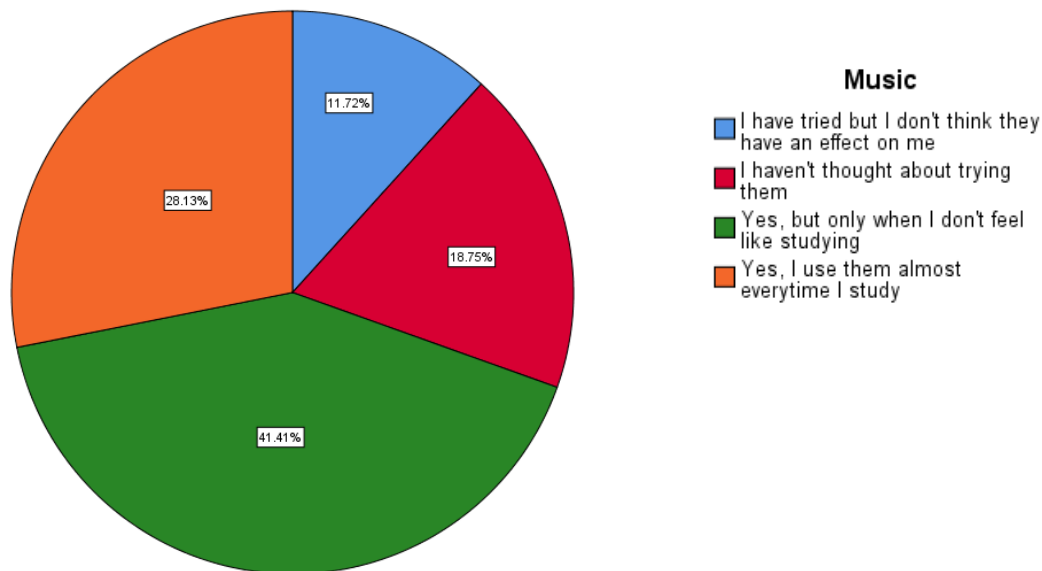


Figure 7: Pie chart of listening to music while studying

When considering about responses of students on listening to music on YouTube while studying similarly as for motivational videos they use only when they don't feel like study. 18.75% haven't thought about trying to listen to music while studying and 28.13% use music almost every time when they study. There are also undergraduates who think that listening to music has no effect on focusing on studies.

Table 6: Table of comparison of watching motivational videos or non-educational videos and listening music.

	Watching motivational or non-educational videos	Listening Music
Yes, almost every day	17.19%	28.13%
Yes, but only when I don't feel like studying	43.75%	41.41%
I have tried but I don't think they have an effect on me	17.97%	11.72%
I haven't thought about trying them	21.09%	18.75%

So, when comparing above two methods, listening to music almost every day while studying to help keep them focused on studies is greater than that for watching motivational videos. But majority of the respondents watch motivational videos when they don't feel like studying when compared to listening music.

5. Conclusions and Recommendations

- Self-learning a difficult part of a certain subject is observed as the major educational purpose of YouTube usage of undergraduates in western province when looking forward to our first objective. Since we are dealing with university undergraduate students, almost every student must need to learn some things by themselves as each and every fact is not taught in a wide syllabus. YouTube is used for Self- learning aspect mostly in universities rather than schools due to variations in educational systems. Here the other four choices can be considered as common things in educational system. So, in this case it is proven that the above factor considerably satisfied with 89.1% of undergraduate students in universities of western province. [table 1]
- Normally, YouTube is rarely used to recall some parts of a certain subject as there are already previously taught stuff in every subject stream. Thus, it is not much needed to use YouTube to recall a lecture. From this survey, that factor is also satisfied for undergraduates with 24.2%. [figure 1].
- Thus, it can be recommended that the YouTube can be used for self-learning rather than to recall some parts of a particular subject of undergraduate students in more efficient way.
- As the first part of the second analysed result, Physical, IT and Engineering fields are observed as the fields with highest responses. And Khan Academy, Free Code Camp and MIT Open Course Ware are the mostly used YouTube channels for education. However, it cannot be concluded that there is a high impact on physical science as the field of study which use Khan academy mostly as the YouTube channel for watching educational videos by considering all undergraduate students who responded. [figure 2]
- But it can be concluded that there is an impact of Physical sciences who use Khan academy YouTube channel for **mathematics and statistics** subjects as the highest frequency by considering Physical stream individually as the second part of the second analysed results. [figure 4]
- Everyone knows that the subject mathematics is the base for every other subject relevant to Physical stream. So, it might be the reason for having the highest frequency for that. Thus, it can be concluded that the survey was successfully done since we got the 21 responses out of 61 for that as the highest one. [table 2]
- As the third one, it can be said that the profession of the content creator is an important factor when selecting an educational video to watch by the respondents as 66% of them have put “yes”.

- Out of 66% (85 responses) of the respondents, there is a high impact of selecting a university lecturer as the content creator of an educational video since it is voted as rank 1 by the majority. As the second highest rank, industry expert can be considered. [figure 6]
- Thus, it can be said that undergraduates in universities of western province mostly prefer to learn under university lecturers and industrial experts who are content creators on YouTube.
- When selecting a video, most respondents have a high impact on the content creator's name of a video and their nationality. The reason can be if the content creator's name is familiar in that subject area, the viewer tends to select that video, and content creators have different accents and styles of explaining according to their nationality. So, it can be the reason that respondents consider more about nationality when selecting a video to watch because the content should be clear and understandable to be effective for learning.
- Thirdly the respondents have mostly considered the number of views a certain video has when selecting a video. Because if the number of views is high then it can be concluded that video is more effective than other videos as many have watched it. [figure 7]
- Undergraduates have not considered much about the number of subscribers a certain educational video has when selecting a video because the number of subscribers does not act as a measure of effectiveness of an educational video which is clearly understandable, consist of better content and etc.
- Public comments and thumbnails are only considered sometimes by most undergraduates. Some undergraduates may look into public comments before watching a video as it may consist criticizes about the content creator, lacking of the video or how effective it is. Thumbnail can be tricky as if it is really something an undergraduate is looking for, they will definitely watch it but the real inside content may differ. So thumbnails and public comments are only considered sometimes when selecting a video.
- Though we tried to find a relationship between preferred average time duration of an educational video and the type of the educational video, we were only able to conclude that there is no relationship between preferred average time duration and preferred type of video. [table 5]
- Most undergraduates are watching motivational videos only when they don't feel like studying. Because to cope up with their studies, they watch motivational videos on YouTube. And many students haven't thought about watching motivational videos on YouTube. Only a few students watch motivational videos every day to focus on their studies. [figure 8]
- Also, most of the undergraduates are listening to music on YouTube only when they don't feel like studying, as the students need something to relax their minds. Only a few students are

listening to music on YouTube while they are studying because they cannot concentrate for studies while they are listening to music. [figure 9]

- We can conclude that undergraduates listen to music on YouTube rather than watching motivational videos or any other non-educational video to focus on their studies.
- Finally, we can conclude that most undergraduate students of western province use YouTube for their educational purposes.

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7. Annexures

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