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## **EVALUATING THE IMPACT OF EDUCATIONAL VIDEOS ON HIGHER LEVEL EDUCATION: A CREATIVE RESEARCH APPROACH**

Veronica Camacho

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EVALUATING THE IMPACT OF EDUCATIONAL  
VIDEOS ON HIGHER LEVEL EDUCATION:  
A CREATIVE RESEARCH  
APPROACH

by

VERONICA CAMACHO

Presented to the Faculty of the Honors College of  
The University of Texas at Arlington in Partial Fulfillment  
of the Requirements  
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HONORS BACHELOR OF SCIENCE IN BIOLOGY

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This project indeed helped me become more knowledgeable about the impact of educational videos and gave me the opportunity to understand the topics of my videos more in depth. I am certain that the lessons and skills I gained through this project will help me in my future.

April 11, 2021

## ABSTRACT

# EVALUATING THE IMPACT OF EDUCATIONAL VIDEOS ON HIGHER LEVEL EDUCATION: A CREATIVE REASEARCH PROJECT APPROACH

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The University of Texas at Arlington, 2021

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With increasing technological advancements, online resources such as educational videos have become an essential study tool for college students. Educational videos deliver information in the form of visual representations, animations and text which is organized in a condensed and organized manner. In this creative research project, two educational videos were created for a Human Physiology course at the University of Texas at Arlington. One video was over systemic and pulmonary gas transport/exchange and the other was over hemodynamics. The program, “Procreate,” was utilized to create the illustrations and “Explain Everything Whiteboard” was used for screen casting. This research paper evaluates the characteristics of an effective educational video and how students use videos

as a study tool. From current research, it is seen that the accessibility, time efficiency, and creativity of educational videos make them widely utilized by college students.

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Educational Videos Role in Higher Education

As technology becomes more accessible and affordable, it has inevitably contributed to the enrichment of education in not only the United States, but also many countries around the world. Many institutions, from prestigious universities to community colleges have increasingly inculcated online resources in classrooms. Educational videos are a resourceful tool that allow for students to have access to information that is presented in a condensed and creative manner. While most information for a course can be obtained in class lectures or assigned textbooks, videos present information in a concise and creative way. Often, students understand the majority of a class lecture, but have difficulties understanding a particular topic; thus, educational videos allow students to refine their understanding of a specific topic.

#### 1.2 Characteristics of an Effective Educational Video

We know educational videos help maximize student learning, but in order for a video to be effective, it must meet certain requirements. There are elements that help make videos impactful in a sense that they help students easily absorb the information presented. From current research, the following elements make a video effective: keeping videos brief, using audio and visual elements, using signaling and highlighting key points, using

a conversational/enthusiastic tone and using guiding questions or interactive elements (Brame C.J, 2016).

### *1.2.1 Visually Appealing*

Educational videos are effective in that they present information through visual representations and animations. Educational videos are especially helpful to students who are visual learners as they help them better understand information with aesthetically appealing diagram and images. When taking exams, visual learners are able to recall information by visual-spatial memory. Research shows that effective videos often include diagrams in the videos and utilize color to make the images visually engaging. It is known that one channel for information acquisition is the pictorial channel as it facilitates the integration of information (Brame, 2016). Khan Academy-style video drawings appear to keep student's attention for longer because of the colorful graphics with the contrasting black background.

### *1.2.2 Explanation is Concise*

It is important to keep videos brief and straightforward. Often, students resort to educational videos when they are looking for an explanation that can save them time and effort. When videos are concise, it increases the viewers' attention and decreases their mind wandering (Brame, 2016). As mentioned, the video should be brief; for example, it is more efficient to make multiple videos which are 6 minutes or less for a lesson instead of a one-hour long video (Brame, 2016).

### *1.2.3 Signaling and Highlighting*

During the video, it is important to utilize a form of cueing method so that attention is drawn to the specific image that is being explained. This can be done by changing colors

or using a symbol, such as an arrow to direct the viewer's attention. This allows the viewer to watch the video without having to figure out what the narrator is referring to. This also allows students to retain information and make connections easily. It is important to only include key information to avoid unnecessary or may overload a student's working memory (Brame, C.J, 2016)

#### *1.2.4 Narrator's Voice*

Lastly, the speaker should speak quickly and with enthusiasm as this encourages students to re-watch the video and hence increase their understanding of the lesson. Additionally, the narrator should use conversational language to create a welcoming atmosphere and engage the student in the lesson. Therefore, it is encouraged for the narrator to use words such as "your" in explanations (Brame, C.J, 2016).

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Estimating the Cognitive Value of YouTube's Educational Videos

One study focused on investigating the cognitive features that support/facilitate student learning. These researchers measured the video's cognitive value by analyzing the number of likes and dislikes based on a survey (Shoufan A, 2018). Additionally, a sample of 105 videos had their cognitive features analyzed to rate their overall effectiveness. To analyze the results from the survey, the researchers used a regression analysis which was meant to analyze the four tests.

##### *2.1.1 Regression Model 1*

The first regression model analyzed cognitive features which explained 68% of the data variance (Shoufan A, 2018). For this analysis, there were four factors that were examined which included pertaining (important new terms/concepts explained first), modality (words were said verbally not written), spatial contiguity (corresponding labels are placed near correct models), and embodiment principles (diagrams are drawn during the video rather than prior) (Shoufan A, 2018). From this, the researcher found that all but the embodiment principles had a positive regression coefficient. The main finding for this was that it is better to have diagrams drawn prior to starting the video.

##### *2.1.2 Regression Model 2, 3 and 4*

The second test which accounted for 56% of the data variance tested for the three video production styles which were paper/white board, presentation slides, and Khan

Academy style (Shoufan A, 2018). From this they found that paper/white boards and presentations have a higher cognitive value compared to that of Khan Academy. The third regression analysis investigated the significance of video length and speed, gender of narrator, and native language. This analysis showed that talking speed and the narrator speaking English as their native language were more significant compared to video length and gender (Shoufan A, 2018). Lastly, regression model 4 analyzed all of the nine features together. The results showed that the variables which have the least influence on students' video preference are spatial contiguity, PPT format, and Khan Academy style.

### *2.1.3 Survey Results*

The researchers also conducted a survey where they found that the main reason for students to like or dislike a video is for reasons relating to understanding or not understanding the material. Other reasons that influence students' video preference are video quality, the speaker's enthusiasm/professionalism, and video length. The results also showed that students like/dislike based on if they are able to solve practice problems after watching the video.

### 2.2 The Effect of Educational Videos on Increasing Student Classroom Participation

A study assessed the impact of the use of educational videos on the participation and engagement of 24 student at the Applied Science University of Bahrain. Students watched videos selected by the researcher as well as videos selected by the students themselves. Data was collected by observations, questionnaires, interviews and testing (Almuslamni et al., 2020). For the questionnaire, it measured a student's participation by allowing them to rank their participation in the classroom from 1 (Never) to 5 (Always). They were also given a series of statements in which they had to state their level of

agreement using a Likert scale. The statements were regarding their perspective on educational videos. The interview involved getting students feedback on their perspective on educational videos (chosen by researchers) and the impact they have had on helping them comprehend class material. The test conducted in the research was to assess the students' understanding of the videos chosen by the researchers and those chosen by the students. The tests were graded on a scale from 1-5. Over the course of the study, the mean score for tests results increased. By the end of study, 54% achieved a 5 on the exam while 25% achieved a 4 (Almuslamni et al., 2020). From the interviewers, the researchers were told by students that the educational videos encouraged them to be a more active participant in class as well as helped them get a better understanding of the class material. From the class observations, it was also seen that students did improve their participation in class. On a scale of 1-5, the mean score of participation went from 2 to about 4.2 over the course of the study (Almuslamni et al., 2020). The results for this study showed that educational videos do indeed have a positive influence on student engagement in classrooms. It was seen that, over time, students became more open to asking questions, sharing their opinions and also more engaged in passive participation like taking notes/listening to the lecturer.

### 2.3 Students Perspectives on Internet-Based Educational Videos in Dental Education

The purpose of this study was to obtain information on students' perception on the usefulness of educational videos in helping them understand the class material in their biology courses. The sample size for this study was 70 students enrolled at the University of Dammam who were asked to complete a questionnaire containing ten questions about the effectiveness of educational videos (Al-Jandan, 2015). From the survey, it was seen that the majority of students agree that educational videos serve a positive role in helping



them better understand class lectures. Notably, there was one slight difference between male and female's opinion on their understanding of class material with and without the videos and the retention of information from the lectures with videos. Additionally, the study found that the students believe two educational videos are the most appropriate as there were 32 students who voted for this option. Concerning the duration of the videos, the majority (47 students) believe that a video should be no more than 10 minutes long (Al-Jandan, 2015). An interesting finding was that males show more support for lecture supplemented with videos compared to females. The researcher states that it is a difficult trend to explain; however, it could be because women tend to display "technology anxiety" at higher levels than men (Al-Jandan, 2015). The researcher also referenced a neuroscience study which reported that a third of every lecture should be comprised of educational videos. From the results, it was concluded that the majority of students agree that educational videos are an effective supplementary study tool, yet videos alone cannot replace class lectures. Thus, the researcher reports that it is beneficial to utilize the various instruction tools including educational videos, especially in medicine/dental academia to ensure health-care providers are knowledgeable and skillfully competitive.

## CHAPTER 3

### METHODOLOGY

#### 3.1 Educational Video Characteristics Research

Prior to creating the videos, research was conducted to better understand the characteristics of an effective educational video. This provided an avenue for the content which was intended to be made. From the information, it was decided that the videos would resemble the format of Khan Academy videos. They would be engaging, clear and concise, and no longer than ten minutes. In this research, different papers were studied that involved experiments where the researcher examined the impact of videos by assessing a student's understanding. These research papers greatly influenced the expected results for this research project.

#### 3.2 Outline and Script

The first step was to create an outline of the video with the main topics and related images. The two resources used to make the outline were Dr. Pollock's Human Physiology PowerPoints and the textbook called *Human Physiology* by Bryan H. Derrickson. These are the two main study resources for this course. Upon completing the outline, it was then revised by Dr. Pollock who provided feedback on the format of the video. Once the outline was approved, the next step was to create a script which was also revised and edited by Dr. Pollock. The script contained the information that would be said in the video, as well as side notes of when to write or point at a specific section of the images.

### 3.3 Video Illustrations

After the script, the preliminary sketches were drawn for the video using the program called “Procreate.” Once the sketches were approved, the final drawings were completed. For the first video, a human heart diagram was drawn to show the different pressure gradients and the direction in which oxygen and carbon dioxide travel. At the sides of the diagram, magnified images of the gas exchange areas were drawn, which are near the alveoli and tissue cells. In these magnified images, the respective gas pressures of within the blood vessel, alveoli and tissue cells were written to highlight the pressure gradient which helps drive the movement of carbon dioxide and oxygen. Additionally, a model of an alveoli with an adjacent blood cell and a tissue with an adjacent blood cell were drawn to show the different chemical reactions that occur between the cells during gas transport. The reactions were meant to show the direction in which CO<sub>2</sub> and O<sub>2</sub> travel. For the second video, blood vessels were drawn at different states of contraction to illustrate resistances and pressure gradients. This was done to highlight how these factors affect blood flow. When a blood vessel is more contracted, it is under less resistance and has a greater pressure gradient, and the blood flow is increased. This was shown through the way blood vessel radius changes due to different conditions. For this video, graphs were drawn to compare the pressure at the different types of blood vessels and to show how cross-sectional area is inversely proportional to velocity of blood flow.

### 3.4 Recording Script

Once the illustrations were finalized, the final step was to record the script. To record, an application called “Everything You Need Program” was used. Before doing the complete recording for the video, a short clip was sent to Dr. Pollock to confirm that the

audio and visuals were at an acceptable quality. In the “Everything You Need Program” application there is an option to enter multiple slides and allows for the recording of each slide individually. At the end, the recordings for all slides are combined to give you the final product. Being able to record each slide individually allowed the video to be worked on in segments, making the recording more efficient.

## CHAPTER 4

### RESULTS

Two educational videos were created for a Human Physiology course offered at the University of Texas at Arlington. The videos will be posted on the Canvas page of the course. Although the videos have not been watched by the students, they are expected to help clarify two topics which are not very intuitive – gas transport/exchange and hemodynamics.

#### 4.1 Gas Transport and Exchange Video

In the first video, the basic principles of gas exchange and transport that occur at the systemic and pulmonary system. For this video, Khan Academy style was chosen for the background and illustrations. The video is approximately 12 minutes long and it contains a total of 5 slides with illustrations/explanations.

##### *4.1.1 Cellular Respiration and 5 Stages of Respiration*

The first slide was designed to introduce the viewer to some basic principles and terminology that should be understood prior to explaining the main topic of the video. For example, the cellular respiration equation was reviewed and explained. The pathways for oxygen and carbon dioxide were included so that the viewer could better understand the direction in which they travel. Next, the five stages of respiration were explained which are 1) Ventilation, 2) Pulmonary Gas Exchange, 3) Systemic Gas Exchange, 4) Systemic gas exchange, and 5) Cellular Respiration.

#### 4.1.2 Partial Pressure and Surface Area

For the second slide, additional basic concepts that should be understood prior to delving into the actual topic were explained. In this slide, partial pressure and surface area were reviewed to show how they affect gas exchange. This was done to emphasize the fact that diffusion of gases at the tissues, alveoli and blood stream occurs because of a partial pressure gradient. This gradient is what encourages gas molecules to move from a high to a low partial pressure. Next, surface area was discussed to highlight the fact that the higher the surface area the greater the gas exchange.

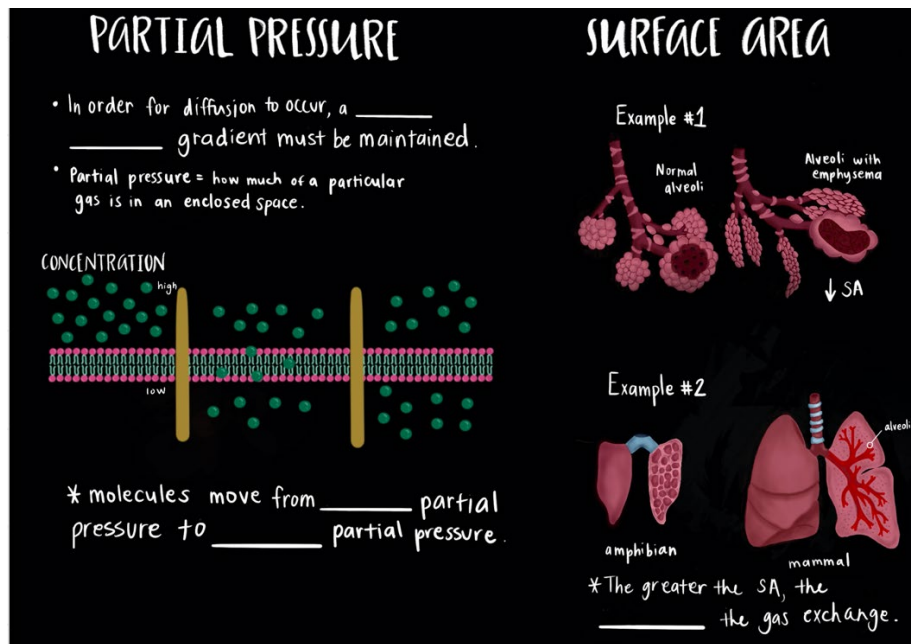


Figure 4.1: (Video #1) Partial Pressure and Surface Area

#### 4.1.3 Pulmonary and Systemic Gas Exchange

For the third slide, gas exchange was described through a human heart diagram with magnified images at the precise areas where gas exchange occurs, which is at the interface of alveoli and systemic tissues. First, pulmonary gas exchange was explained. The differing partial pressures of oxygen and carbon dioxide in the blood stream and alveoli were

included to accentuate the partial pressure gradient. With the pressure of oxygen being higher in the alveoli, oxygen travels from the alveoli into the blood stream. On the contrary, the pressure of carbon dioxide is higher in the blood stream; thus, it travels from the blood stream into the body to then be expelled out of the body through exhalation.

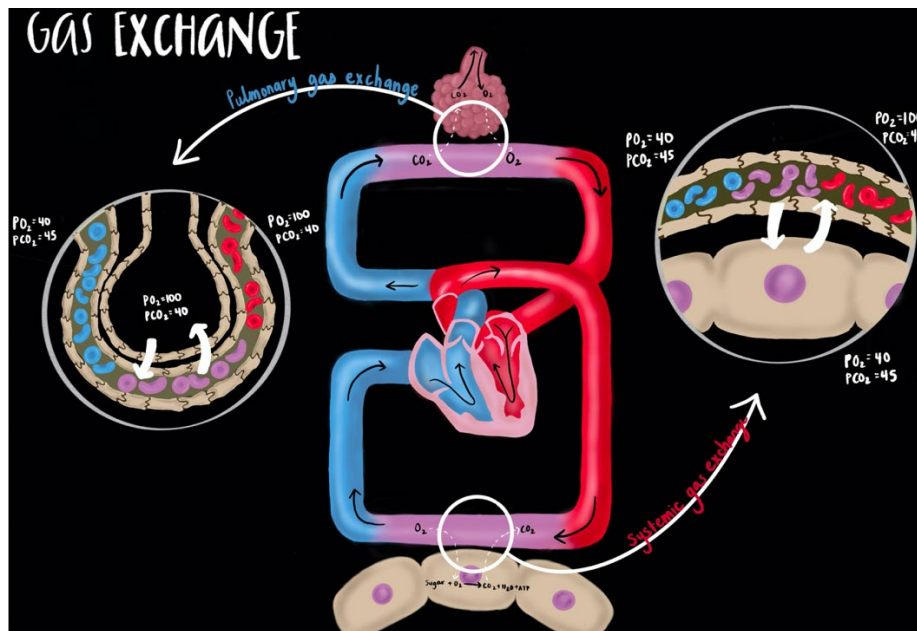


Figure 4.2: (Video #1) Pulmonary and Systemic Gas Exchange

#### 4.1.4 Gas Transport

Lastly, gas transport was delineated through a series of reactions that occur between red blood cells and the alveoli/systemic tissues. The main methods of oxygen and carbon dioxide were also highlighted. Oxygen's main method of transport is bound to hemoglobin in red blood cells (98.5%) and only 1.5% is dissolved in blood plasma. Carbon dioxide on the other hand mainly exists in the blood stream as bicarbonate ions (70%), while only 7% is dissolved in blood plasma and 23% is bound to hemoglobin in red blood cells.

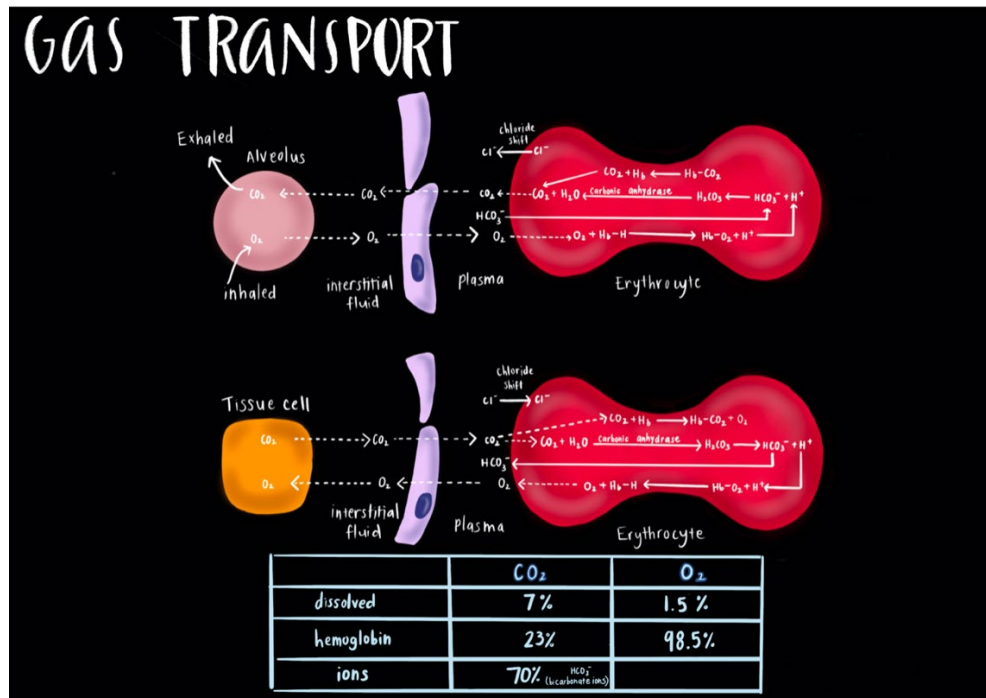


Figure 4.3: (Video #1) Gas Transport

## 4.2 Hemodynamics Video

The topic for the second video was hemodynamics, which is the study of factors that affect blood flow. In the video, the following factors that affect blood flow are discussed: Resistance, Velocity, and Pressure Gradient.

### *4.2.1 Blood Vessel Characteristics*

Prior to explaining the hemodynamic factors, the different characteristics of all of the blood vessel types were discussed. In this slide, the different blood vessels' anatomical vessel layers, differences in pressure gradients, vascular compliance, and their ability to adjust their diameter were emphasized. The reason for reviewing these characteristics is essential because certain vessel types have particular characteristics that can impact blood flow.



#### 4.2.2 Blood Flow Definition and Pressure Gradient

The next slide was for discussing the definition of blood flow as well as pressure gradient and its influencing factors. For blood flow, a short definition was included, and the blood flow equation was explained to show the relationship of blood flow to pressure gradient and resistance. Next, pressure gradient was explained by going over different examples of blood vessels with different pressures at the ends, while also discussing the three main factors that affect pressure gradient, vessel type, vascular compliance, and cardiac output. Vascular compliance is the ability of a blood vessel to stretch without the changing pressure significantly. Compliance differs among the different blood vessel types with veins having the greatest compliance and arteries having the lowest. A graph was drawn to convey the differences in compliance among the different blood vessels.

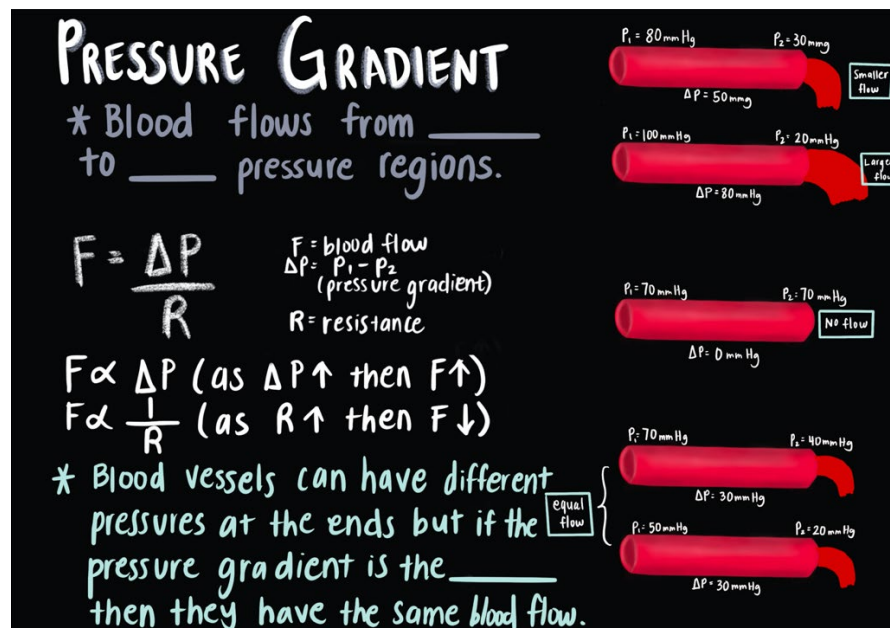


Figure 4.4: (Video #2) Blood Vessels with Different Pressure Gradients

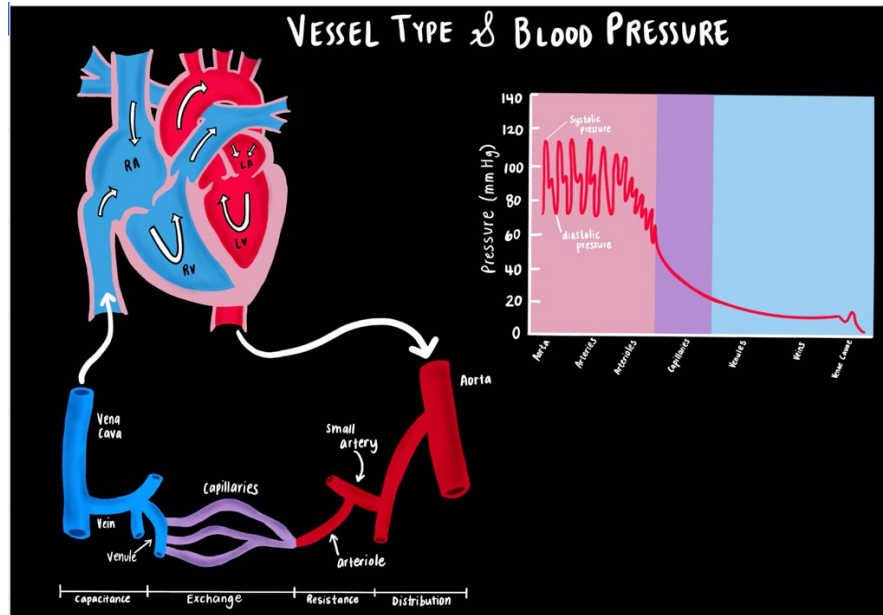


Figure 4.5: (Video #2) Blood Pressure and Blood Vessels

#### 4.2.3 Velocity

For this slide, it was explained how velocity is inversely proportional to the cross-sectional area. Meaning the larger the surface area, the greater the blood flow. In contrast, the smaller the surface area the lower the blood flow. The cross-sectional surface area decreases from the arteries to the capillaries and increases from the capillaries to the veins. This results in greater velocity in the large arteries and veins and the slower velocity in arterioles and capillaries. The reason for this is because as the surface area increases, the blood comes into more contact with the blood vessel walls, increases friction, resulting in decreased blood flow.

#### 4.2.4 Resistance and Influencing Factors

Resistance was defined using the resistance equation which includes all of the different factors that influence resistance, including blood viscosity, vessel length, and blood vessel radius. It is seen that blood viscosity and blood vessel length are directly proportional, while radius is inversely proportional, to resistance. In other words, as blood

viscosity and blood vessel length increase, resistance increases. On the contrary, as radius increases, resistance decreases. In the end, total peripheral resistance is discussed which is the resistance exerted by all of the different blood vessels.

## CHAPTER 5

### DISCUSSION

From analyzing a series of peer-reviewed articles on the effectiveness of educational videos, it is shown that videos provide many benefits to college students such as encouraging them to take control of their learning, allowing for flexible learning, contributing positively to motivation and confidence levels and overall improving student performance.

#### 5.1 Final Comments on Educational Videos

As technology continues to evolve and pave the way for new ways to present information, educational videos are inevitably going to continue to be a major advancement in higher education. Educational videos have shown to be effective in promoting individualized learning and introducing information in different ways (Carmichael, 2015). In a large pool of educational videos like YouTube, students are able to choose the types of videos that best meet their needs (Saurabh & Gautam, 2019). This allows for personalized and individualized learning. It is also known that students utilize videos to become more familiar with a topic before attending class lectures (Skyes, 2015). This reinforces the idea that educational videos are not meant to replace class lectures, but rather to supplement them and to overall help students with retaining the information in their long-term memory.

### *5.1.1 Cognitive Theory of Video Learning*

Current research has drawn much attention to Richard Mayer's "Cognitive Theory of Multimedia Learning" which explains the process of active learning. Mayer's theory is centered around three principles: 1) There are two different channels for processing information which includes visual and auditory; 2) Each channel has a so called "limited capacity;" 3) To retain information, active learning is essential (Carmichael, 2014). This theory also highlights the importance of selecting, organizing and integrating information (Carmichael, 2014). The selection process involves choosing to process certain words and images (Carmichael, 2014). The organization process involves making sense of the selected words and images; for example, this can be done by creating a mental note or image. Finally, the last step involves utilizing prior knowledge to thoroughly understand the new information which will aid in storing it in long-term memory.

### *5.1.2 Effective Video Design*

Nowadays, there is a myriad of software and video editing programs which encourage diversity in the type of videos available online. This is an advantage as it allows for different options to be available to students and allows for video creators to choose the most appropriate style for their video according to the subject. For example, math videos tend to be more practice-problem based while science videos tend to be more illustration or diagram based (Saurabh & Gautam, 2019). It is essential to choose the appropriate video style to avoid overly complicated explanations and cognitive load. This includes ensuring that the organization of the video is formatted in a way that helps the student make connections and thoroughly understand the main topic of the video. This means avoiding excess information as well as only including relevant images (Saurabh & Gautam, 2019).

Thus, choosing the appropriate and most effective graphics is also important for an effective video as it reduces distraction and overall makes a video more effective.

### *5.1.3 Role of Educational Videos*

The role of educational videos is to serve as a supplementary tool for class lectures and other study materials. There is no research that has sufficiently shown educational videos can replace class lectures. Educational videos are meant to aid students in their understanding of class material or for students to review a certain topic. Research shows that there is currently no evidence that educational videos decrease class attendance. On the contrary, there is evidence which states that educational videos increase student engagement and participation in their courses (Carmichael et al., 2014). Thus, it can be said that educational videos serve as a tool for aiding with the acquisition of knowledge, motivating student to do their own research, and stimulating interest in a topic (Carmichael et al., 2014). In turn, this helps students perform better on their exams. One study found that scores increased by 2% throughout the course of three years (Almuslamani et al., 2014). This goes on to support the fact that educational videos serve as a catalyst for helping students improve their overall academic performance.

### 5.2 Future Research

This research shows that educational videos are a positive influential factor in higher level education. Future research should include exploring ways to continue making effective educational content for students. One area of focus could be looking at what specific graphics or cues are most effective in conveying information (Carmichael M, 2014). The information from this research focus could provide useful information for the type of graphics that facilitate memorization, as well as the types that should be avoided.

Another area of future research should involve finding the most effective video format for various subjects. Although there are many ways to present information in a video, it is important to choose the most appropriate style and organization so that there is not a cognitive overload. It is crucial to find ways to keep information brief, concise, and effective. Finally, research could be done to investigate whether educational videos could serve as the primary resource for a course. This would especially be beneficial for people who would not have the opportunity to obtain a higher education otherwise.

## CHAPTER 6

### CONCLUSION

Current research shows that educational videos are an important source for learning. They encourage students to engage in their classes, help students in learning information through visual and auditory channels, contribute to student motivation, and empower them to learn at their own pace. Research also illustrates that effective educational videos are concise, only include helpful graphics, explanations that are not redundant, conversational language used by the narrator, and a signaling cue included to guide the viewers' attention. Many research studies agree with the positive influence of educational videos; however, there is not enough evidence to say that they can completely replace class lectures. Educational videos serve more as a way to gain a better understanding of a topic or to get exposed to a new information prior to attending class. Therefore, professors should encourage students to utilize educational videos to their advantage as this could improve their academic success.



## REFERENCES

- Al-Jandan, B. A., Farooq, I., & Khan, S. Q. (2015). Students' perspectives on the relevance of internet-based educational videos in dental education. *Journal of Taibah University Medical Sciences*, 10(3), 288–292.  
<https://doi.org/10.1016/j.jtumed.2015.05.001>
- Brame C. J. (2016). Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. *CBE life sciences education*, 15(4), es6. <https://doi.org/10.1187/cbe.16-03-0125>
- Carmichael, M., Reid, A.K., & Karpicke J.D. (2014). Assessing the Impact of Educational Video on Student Engagement, Critical Thinking and Learning: The Current State of Play *A Sage White Paper*. pp. 1-22.
- Derrickson, B. (2019). *Human Physiology*. Hoboken, NJ: Wiley.
- Saurabh, S., & Gautam, S. (2019). Modelling and statistical analysis of YouTube's educational videos: A channel Owner's perspective. *Computers & Education*, 128, 145–158. <https://doi.org/10.1016/j.compedu.2018.09.003>
- Shoufan, A. (2019). Estimating the cognitive value of YouTube's educational videos: A learning analytics approach. *Computers in Human Behavior*, 92, 450–458.  
<https://doi.org/10.1016/j.chb.2018.03.036>
- Shoufan, A. (2019). What motivates university students to like or dislike an educational online video? A sentimental framework. *Computers & Education*, 134, 132–144. <https://doi.org/10.1016/j.compedu.2019.02.008>

Sykes, R. (2012). The Impact on Student Learning Outcomes of Video When Used as a Primary Teaching Tool in the Internet Hybrid. Electronic Theses and Dissertations. Paper 1517. <https://dc.etsu.edu/etd/1517>

## BIOGRAPHICAL INFORMATION

Veronica Camacho is a senior majoring in biology and minoring in biochemistry/neuroscience at the University of Texas at Arlington. Her research interests include education, psychology and public health. After graduating in the Spring 2021 semester, she plans to attend Texas A&M College of Dentistry to earn her Doctoral Degree in Dental Surgery. During her undergraduate years, Veronica was heavily involved in the Pre-Dental Society at UTA and participated extensively in dental community clinics and events. She also participated in a summer dental enrichment program offered by Texas A&M College of Dentistry that allowed her to get an insight of the rigorousness of dental school. Through these opportunities, she grew her passion for dentistry and gained valuable mentors who have helped her through her career journey. As a dentist, she plans serve her community by donating her time to volunteering events that help educate and treat people who need dental care the most.