

ASSESSING STUDENTS' ATTITUDES ON THE USE OF YOUTUBE VIDEOS AS A SUPPLEMENTARY TOOL FOR PREPARATION OF BIOLOGY LABORATORY PRACTICALS AT THE CENTRAL UNIVERSITY OF TECHNOLOGY, BLOEMFONTEIN

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Abstract

Research shows that the use of educational videos and multimedia in higher education is increasing rapidly. One of the online social networks in Biology laboratory practicals that enhance learning is the video sharing site YouTube. Experience shows that students often come to practical sessions unprepared as they don't read through the supplied printed material. This can create problems during a practical, as they have difficulty in translating the words into required action. This group of students is a generation that is digitally inclined, spending a lot of time downloading videos; thus it seemed logical to explore YouTube as an alternative way for students to prepare for Biology laboratory practical. In this article, students' attitudes towards the use of YouTube videos as a supplementary tool for preparation of Biology practical were explored.

The study was conducted on total of 63 first-years B.Ed.: Natural Sciences students with an average age of 21 years. There were 36 female students and 27 male students for whom video links were suggested. They responded to a brief survey which was made up of closed and open ended questions. The results demonstrated that 83% of the students viewed the YouTube videos before they came to the laboratory. 98% of students agreed that videos should be used as a form of supplementary tool for preparation of laboratory practicals. Based on these findings, 97% of students agreed that if carefully chosen and aligned to the lessons' objectives, YouTube videos can play a pivotal role in enhancing the teaching and learning of Biology practical work.

Keywords: YouTube videos, Biology practicals, Supplementary tool.

1. INTRODUCTION

There is no doubt we are living in times of fast paced technological change where students of today have grown up within a world of pervasive technology including mobile phones, digital cameras and the omnipresent internet (Clifton and Mann, 2010; Duffy, 2008). Described as Gen-X, Millennials (Olsen, 2005), these students are able to play games in immersive 3-D worlds, instant message friends, listen to podcasts, and download YouTube videos to name a few (Duffy, 2008).

YouTube has emerged as a major host of online video content since 2005 and is now the third most popular website behind Google and Facebook (Alexa 2011). This site hosts user-generated content such as personal video clips and music videos, but has also been used within higher education as a way to disseminate teaching based material to current and potential students (Wilkes *et al.*, 2011). As a teaching supplement, YouTube, can inspire and engage students and support their virtual learning style (Burke and Snyder, 2008).

Video demonstrations are considered to be one of the useful ways for preparing students for laboratory practicals, these benefits may be dependent on the type of task and prior understanding (Merry *et al.*, 2015). Studies have been conducted to show that appropriate pre-laboratory preparation is beneficial to students as it facilitates their learning and understanding (O'Brien and Cameron, 2008; Jones and Edwards, 2008). Students often arrive at practicals with no clear understanding of techniques employed, the skills required to conduct the experiment, or understanding of the underlying scientific principles. Thus, appropriate pre-laboratory preparation is beneficial to students as it facilitates their learning and understanding (O'Brien and Cameron, 2008). In a study done by Croker *et al* 2010 video exemplars of practical techniques were used in physiology practical sessions, these videos were made available prior and during the practical session at small group workstations designed to facilitate student interaction. Results of this study showed increased student engagement. Furthermore, demonstrators in these practical sessions reported that they spent a majority of time answering higher level questions rather than simply trouble-shooting technical equipment issues (Croker *et al.*, 2010). Among the potential benefits of video clips, is the step by step demonstration of process, attracting and capturing the class attention, presentation of scenarios and physical settings (Pereira *et al.*, 2004).

As a result of the reasons given above; we felt that the use of innovative video technology resources such as YouTube could provide a more efficient, flexible and effective way to guide students through a practical and consequently may both improve student learning. Thus, it was the aim of this study to assess the student's attitude towards the use of YouTube videos as a supplementary tool for preparation of Biology laboratory practicals.

2. METHODOLOGY

Setting: The research was carried out at the Central University of Technology, Bloemfontein, South Africa within the Department of Maths, Science and Technology Education; Biology laboratory. The study involved first year undergraduate B.Ed.: Natural Sciences students. Three Short videos describing the experimental procedure of experiments were downloaded from YouTube and processed properly. The website of YouTube videos performed was made accessible to the students 1 week before the practical to encourage familiarisation in preparation of the practical session.

2.1. YouTube videos of Biology practical

The following YouTube videos for demonstration of Biology practicals were used in this study:

2.1.1 *Cheek epithelial cell-How to prepare a wet mount microscope slide.*

2.1.2 *Onion skin epidermal cells-How to prepare a wet mount microscope slide.*

2.1.3 *Test for reducing sugars*

2.2. Participants

B.Ed.: Natural Sciences students with an average age of 21 years took part in this study. There were 36 female students and 27 male students. Students' participation was voluntary and anonymous.

2.3. Questionnaire

A closed ended questionnaire was designed to assess students' attitudes towards the use of YouTube videos. The evaluation used an eight-point response format (table 1.) in which students were asked to rate

the degree of their agreement as either Agree, disagree or uncertain. Open ended questions were also used to encourage students to comment on the beneficial features of the YouTube videos.

3. RESULTS AND DISCUSSION

A questionnaire survey was conducted of students' attitudes towards the use of YouTube videos as a supplementary tool for Biology laboratory practicals. The results are summarized in Table 1.

Table 1: Evaluation of students' attitudes towards the use of YouTube videos as supplementary tool for Biology laboratory practicals.

Statements	%Respondents		
	Agree	Disagree	Uncertain
1. Do you prefer YouTube video guides to printed instructions on your practical manual?	71%	17%	0.3%
2. Do you prefer YouTube videos demonstrations, to a demonstrator showing you how to do your practical?	84%	11%	0.6%
3. Do you think the YouTube videos helped you understand and complete the laboratory work?	94%	0.4%	0.3%
4. Did you view the YouTube videos before you came to the laboratory?	83%	16%	0.2%
5. Did the YouTube video guides affect your attendance at practicals positively?	84%	0.6%	0.7%
6. I believe that the YouTube videos experiments could be of help as a supplementary tool in the preparation of the experiment.	98%	0.12%	0%

3.1. Preference for YouTube video guides

Given the novel and innovative nature (to these students) of this form of learning support, it was satisfying that 71% said they preferred YouTube video guides to printed workbooks. In addition, 84% also indicated they preferred YouTube video guides to a demonstrator; some of the comments they gave pertaining to this were as follows:

'More videos of the experiments should be played and be given more time to conduct what you are watching.'

'Videos, make it easier for us to follow procedure correctly.'

'The video explain and demonstrate the practical's unlike only when procedures are written down without demo.'

'It helps with understanding rather than abstraction from printed guides alone.'

'Videos take away the frustration of the experiments.'

'It's easy to remember things when you see them, than reading and recalling what you read. Some students don't understand what they are reading. Helps to see and know exactly what your results will look like (visually inclined students).'

11% of the students felt that they also needed aid from demonstrators before watching the videos. Some of the comments they gave are as follows:

'Disadvantage about video, is that when you encounter a problem about the experiment, you can't get clarity on what you don't understand.'

'Although the videos are important, we also need aid from our demonstrators before watching the videos.'

'There will be instances we need clarity from our lecturer because some of the things in the video might not be clear.'

3.2. YouTube videos in understanding and completing the laboratory work

94% of students consider that the YouTube videos are the most useful resource for understanding and completing the Biology laboratory sessions. These are the comments that some of the students gave following the previous statement:

'It helps to understand clearly the work that needs to be done in the lab.' One potential advantage of using videos is the step by step demonstration process together with the presentation of all materials used (Pereira *et al.*, 2004).

3.3. Pre-viewing of the YouTube videos

The website for YouTube videos viewed in the practical were also made freely available to students 1 week before the practical session. 83% of students viewed the YouTube videos before the practical session and 16% did not preview the YouTube videos. Generally, those that did not didn't indicate the reason.

3.4. Attendance at practicals

When asked, 'Did the YouTube video-guides affect your attendance at practicals positively?' 84% said agreed and 0.6% disagreed. This indicates contradiction to the popular belief that access to learning materials beforehand encourages the student's attendance to the practical. 84% of the students viewed the YouTube videos beforehand, together with the high positive response rate obtained here (84%) may be related to the fact that students knew that YouTube videos would be used in the following practical and because they found this learning approach to be useful, it encouraged them to attend subsequent practicals.

3.5. YouTube as a supplementary tool

We needed to know if the YouTube videos did more than just guide the students in conducting the Biology laboratory practicals. We asked, 'Do you believe that the YouTube video experiments could be of help as a supplementary tool in the preparation of the experiment?' to which 98% agreed and 0.12% disagreed. A number of students wrote supplementary comments, to elaborate on this aspect further. Some of the representative comments are as follows:

'As supplementary to prepare for laboratory, gives clear clarification on how to conduct an experiment it shows all methods and expected results.'

'As supplementary tool, it's easy to remember things when you see them, than reading and recalling what you read. Some students don't understand what they are reading. Helps to see and know exactly what your results will look like (visually inclined students).'

'As supplementary, because we know what to expect, therefore the experiments become easier to conduct, observation is also easier'.

'Yes as supplementary it will be helpful to watch it first before real experiment.'

'Yes as supplementary it can be a good and fast summary of the experiment.'

'Yes as supplementary, for lab preparation, it helps us understand the experiment we are going to conduct, prepares us thoroughly to have more knowledge so as to not struggle.'

'Yes as supplementary to prepare us before experiment is conducted, it helps us see the picture, to see what we are supposed to do; it makes it easy when you do it practically.'

'Videos, good tool for preparing for the experiment'.

'Videos make us to be more interested in doing the experiments. When we watch them prior the experiments, we learn and have fun at the same time. We also appreciate it when the lecturer adds more guides after watching the video.'

'Yes as supplementary, in order to have an idea of the experiment to be conducted and compare the results of the video clip with those done by students.'

'Yes, they prepare us for experiments. We have clue of what to be expected from us. The lectures work becomes easy, and we as students will understand more.'

4. SUMMARY AND CONCLUSIONS

The study showed that the use of YouTube videos as a supplementary tool in Biology practicals had positive effect upon students' perception regarding the enhancement of their learning motivation. In accordance to the data, this alternative method captured the attention of the students. This is especially applicable in this digital era with the reducing attention span of the Gen-X, Millennials (Clifton and Mann 2010). In a study done by Hsin and Cigas (2013), short videos were used to enhance student satisfaction and motivation for online introductory course computer science/mathematics. They achieved a higher percentage of involved students and their average grades increased. Secondly, in addition to keeping students focused, the students highlighted that using YouTube videos in learning assisted them to remember the practical procedure they needed to carry out as compared to just reading from a practical material. This is in agreement with results obtained with other similar studies where it was observed that it is often easier to recall something than you have seen than heard (Clifton and Mann 2010). As a result of this 84% of students mentioned that YouTube video-guides affected their attendance at practicals positively. On the other hand some students felt that even though the YouTube videos were a good tool for preparation of the Biology practical, they still needed the lecturer's or demonstrator inputs and additional commentary after viewing the videos. Thus, YouTube videos can play a pivotal role in enhancing the teaching and learning of Biology practical work if carefully chosen and aligned to the lessons' outcomes.

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