Letters in Information Technology Education (LITE)
Vol 4, No 2, 2021, pp. 80 – 85
e-ISSN: 2654-5667

Learners' Perceptions about TikTok Tutorial Videos as Instructional Media in Learning Statistics

Kusumadyahdewi [a,1,*], Kusumarasdyati [b,2]
[a]Faculty of Education in UIN Maulana Malik Ibrahim, Malang, Indonesia
[b]Faculty of Languages and Arts in Universitas Negeri Surabaya, Indonesia
[1]kusumadyahdewi@pips.uin-malang.ac.id; [2]kusumarasdyati@unesa.ac.id
*Corresponding author

Article Info

Article history:
Received: Aug 28, 2021
Revised: Sep 20, 2021
Accepted: Nov 18, 2021

Keyword:
Statistics
Instructional Media
Audio-visual Aid
Tiktok

ABSTRACT

Introductory statistics has been considered an anxiety-inducing course by undergraduates so efforts need to be done to reduce or eliminate their negative attitudes about statistics. One of such efforts is using TikTok tutorial videos as instructional media. The current study aimed to find out the undergraduates' perceptions about the use of TikTok tutorial videos in introductory statistics classes, describe the challenges they encountered in using the videos and elicit their feedback to overcome these challenges. The results showed that in general they had favorable perceptions about the use of TikTok tutorial videos, but they reported three challenges: the speed, the backsounds and the instructions of the tutorial videos. Therefore, they suggested solutions for the challenges, and added some other feedback about other aspects of the videos, namely, the quality of the pictures, the content and the links. Implications for the teaching of introductory statistics are proposed based on these findings.

I. INTRODUCTION

The COVID-19 pandemic has caused universities across the globe to limit on-campus activities and triggered a surge of online teaching and learning. Lecturers turn to online teaching platforms such as Edmodo, Google Classroom and Zoom to educate the young minds in virtual classrooms via synchronous and asynchronous sessions [1] [2]. To make the lessons in those platforms more effective, many lecturers make good use of technological tools with various functions [3]. Some examples of such tools include e-mail for one-on-one communication, chats and instant messaging for group discussion, and blogs for uploading the materials or publishing the learners' thoughts and written works. Another teaching tool that has gained momentum for the past few years is social networking sites [4]. As the name suggests, social networking sites originally connect people with family and friends on the web for entertainment, but they can become a powerful educational tool due to the features of text, picture, music, link and video sharing [5]. When the use of mobile phones became more prevalent, the social networking sites were available for download as an app.

One of the most widely used social media app is TikTok, which is video-based. In this app, the users can create short videos, ranging from fifteen seconds to three minutes, and upload the videos as contents in their accounts. To make the videos more attractive, the users may use some features, such as soundtrack and change of speed [6]. To add soundtrack to the videos, the users may select one of the abundant sounds in the app or upload their own sounds. In addition, they can change the speed of the videos or the sounds, creating an interesting effect and attract viewers. Within a short time the app gained a lot of users and viewers all over the world, prompting individuals and institutions to see its potentials as an educational tool and spread knowledge through this app [7] [8] [9]. Even educators tried to incorporate this app into their classes as instructional media to facilitate learning at the tertiary level [10] [11]. To our best knowledge, however, there have not been any studies that examined the learners' perceptions about

the use of TikTok videos as an audiovisual aid in higher-education statistics classes.

The present study attempted to fill this gap by eliciting how the undergraduate learners perceived TikTok tutorial videos as instructional media in introductory statistics classes. The statistics classes were held online in Google Classroom, and the materials included computations by means of Excel. Although the procedures of the machine computation were explained in written form in Google Classroom posts, it was deemed important to provide tutorial videos to enable the learners to visualize the procedures of the computation [4] [12] [13] [14]. Therefore, the tutorial videos were created in the TikTok app and uploaded as an attachment in the relevant posts in Google Classroom. For example, the tutorial video of computing a correlation coefficient in Excel was attached to the post about Pearson Product Moment. This study aimed to describe (1) the learners' perceptions about the use of these tutorial videos in the statistics classes, (2) the challenges they had, and (3) their feedback to overcome the challenges. The next section details the methodology of the study, then the research results are presented and discussed. This paper ends with the conclusion and the implications for the teaching of introductory statistics.

II. Methods

The current study was descriptive research approached by using mixed method. The quantitative approach gave insight about the learners' perceptions toward the use of TikTok videos on average when they were learning statistics. Afterwards, the qualitative approach allowed the researchers to gain deeper understanding about this issue. The target population of the study included all undergraduates taking the course "Quantitative and Qualitative Analyses" at the English Department of a state university in Surabaya. However, only two out of six classes (N=60) became the accessible population because one of the researchers taught them statistics and the other classes were taught by other lecturers who did not use TikTok videos. Total sampling was employed to obtain the participants of the study so all of the undergraduates in two classes were selected as the sample, but seven of them failed to complete the research instruments and were considered mortal. The rest (N=53) became the sample of the study. To respect their privacy, pseudonyms are used instead of the participants' real name.

To collect data from them, a questionnaire comprising two parts was administered online through Google Form. The first part of the questionnaire consisted of 10 Likert-scaled items which elicited the learners' perceptions about various aspects of TikTok videos used as instructional media in the statistics classes and 1 item which obtained information about how often they viewed video in TikTok app. The first ten items contained statements, which the participants had to respond by choosing one of the options expressing how far the participants agreed with (1=strongly disagree, 2=disagree, 3=moderately agree, 4=agree, and 5=strongly agree). The last item about the frequency of TikTok video viewing was also of Likert-scale type, but the options were different (1=never, 2=occasionally, 3=sometimes, 4=often, and 5=always). The above items in the initial part of the questionnaire resulted in numeric data, while the other two items in the second part of the questionnaire contained two open-ended questions which required the participants to explain their problems in using TikTok videos presented in the statistics classes and their suggestions about the use of TikTok videos for pedagogical purposes.

The numeric data were analyzed by computing the means of each item and all of the items in the first part of the questionnaire to observe the participants' perceptions in general. Next, the data obtained from the open-ended questions in the second part of the questionnaire were analyzed by following these procedures: (1) familiarizing and categorizing, (2) coding and reducing, and (3) interpreting and representing [15]. The challenges that the participants encountered and their suggestions were classified and coded before they were interpreted. The results of the analysis are presented in the next section.

III. Result and Discussion

In general, the undergraduates had favorable perceptions about the tutorial videos of statistical computations made in TikTok app. The initial part of this section details their perceptions about various aspects of the tutorial videos, followed by the challenges they encountered while viewing the videos and their feedback to overcome these challenges.

Perceptions about Videos

Most of the undergraduates who participated in this research turned out to be TikTok users, but the frequency of viewing short videos in the app varied (Fig. 1). Only a few of them always or occasionally used TikTok outside the classroom, i.e. 13% each. The number of undergraduates who often watch videos in TikTok was slightly higher (21%), followed by those who never did (25%). The majority (28%) sometimes viewed TikTok videos. Overall, more undergraduates had installed and used this app (75%)—with various frequency of video viewing—than those who had not at all (25%).

Although some learners did not have a TikTok account, they—like the rest of the class—could still view the tutorial videos because these videos were downloaded from TikTok and posted in Google Classroom. There were four tutorial videos which demonstrated how to compute (1) mean and standard deviation, (2) Pearson r, (3) Spearman r, and (4) t value by

means of Excel. Each video was posted as an attachment in the relevant post. For instance, the tutorial video about t value computation was attached to the Google Classroom post about t-test. Their perceptions about the videos are presented in Table 1.

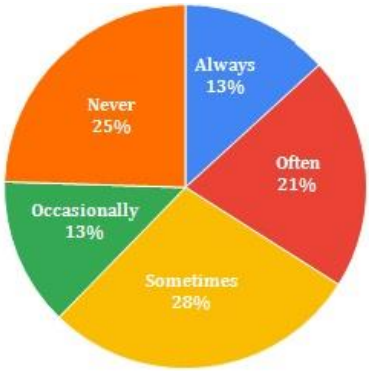

Fig. 1. The Frequency of Viewing Videos in TikTok App

TABLE I. THE LEARNERS' PERCEPTIONS ABOUT TIKTOK VIDEOS

Perceptions	$\bar{X}$
The videos gave me new understanding that I didn't have after reading the statistics written material in the Google Classroom post.	4.15
The videos help me to understand how to compute numeric data in statistics.	4.02
The videos helped me to understand the textbook information better.	3.92
Learning from the videos fit well with my personality and preferred learning style.	3.91
The videos gave me more confidence in my ability to compute numbers in statistics.	3.81
I was satisfied with the look of the videos.	3.58
I was satisfied with the design of the videos.	3.55
I think the length of the videos was alright, neither too short nor too long.	3.53
I liked the backsounds in the videos.	3.28
I think the speed of the videos was alright, neither too fast nor too slow.	2.87

From the learners' perspectives, the videos benefited them much with respect to learning, but in terms of the videos' features there were a few things that needed improvements. The learners had the most favorable perception about how the TikTok tutorial videos gave them new understanding about the materials ($\bar{X}$=4.15). They learned the basic concepts of a formula and the example which showed how to compute numeric data manually from the written explanations in Google Classroom. When a tutorial video about the same formula was attached to the Google Classroom post, they gained new knowledge about machine computation of the formula. Moreover, the video actually assisted them to compute numeric data when they had to use statistics in general ($\bar{X}$=4.02). In addition to boosting the learners' comprehension about the materials in Google Classroom posts, the videos also helped the learners to understand the concepts in statistics textbooks ($\bar{X}$=3.92). Both the Google Classroom posts and the textbooks only described the procedures of manual computations, so the tutorials of machine computation in the video became a crucial part of the materials. These findings were in line with the previous studies which demonstrated the effectiveness of videos in facilitating the learners to understand the concepts and perform statistical computations [12] [16] because a video "… when done well and used wisely, shows rather than tells" [17].

Aside from supporting the acquisition of the learning materials, the videos also nurtured the affective domain of learning for most of the learners. They considered learning from the tutorial videos was suitable to their personality and learning style ($\bar{X}$=3.91). Regardless of their type of personality, the introverted and extroverted learners found the TikTok tutorial videos useful. Similarly, the learners with different learning styles—visual, auditory and kinesthetic—considered the audiovisual aids as the appropriate media to promote learning statistics. This finding supported the essential role of learning styles in the success of learning statistics [18]. Most of them also thought that the videos boosted their confidence in computing numeric data ($\bar{X}$=3.81), possibly because they knew how to perform machine computation by means of Excel and were no longer anxious about committing errors which sometimes occurred in manual computation [19]. Thus, they became more confident due to the accuracy of the computation results. It provided empirical evidence of how the affective aspects could hardly be neglected in the teaching and learning of statistics as they became determining factors in the success of learning [20]. In addition, it was specifically in favor of the previous research about the positive effect of viewing video showing the use of statistics on the learners' attitude about statistics [21].

Lastly, the features of the TikTok tutorial videos scored lower than the learning materials and the affective aspects of learning. On average, the learners felt content with the look ($\bar{X}$=3.58), the design ($\bar{X}$=3.55) and the length of the videos ($\bar{X}$=3.53). All of the tutorial videos lasted for 1 minute or less because it was assumed that the learners would find shorter videos more interesting and less time consuming to watch. Indeed, the length of TikTok videos negatively correlated with the likes and comments from the viewers [7]. The backsounds used in the videos, however, received a lower score ($\bar{X}$=3.28) due to the beat of the songs. The speed of the videos ranked the last ($\bar{X}$=2.87). It seemed the last two features became grave

challenges for the learners so they will be elaborated in detail in the next section.

Challenges in Video Use

The learners reported three challenges they encountered when viewing the TikTok tutorial videos, namely, the speed of the videos, the backsounds and the absence of instructions. Each challenge will be described below.

First, many participants thought the tutorials presented in the videos were too fast and, therefore, made them struggle more to understand. For instance, Meidy wrote that "… the speed of the video is too fast. Even though I set the speed into 0.75x, I still hard to understand it." While Meidy reduced the speed of the videos, Sasiwi viewed the videos repeatedly with the same speed: "I think the speed of the video is too fast, so I need to play it twice or more to get the point of the video." Indeed, the tutorial videos were manipulated with respect to time to fit the 1-minute limit in TikTok app. Actually, such manipulation of time is an advantageous attribute of videos as instructional media [22], but this study indicated the need for caution in the temporal manipulation of videos. The videos became shorter at the expense of the content comprehensibility.

Another challenge related to the use of TikTok tutorial videos was the backsounds. According to some of them, the beat of the songs chosen for the video were too strong. Resty, for example, described one of the songs in the following manner: "The videos' music could not make me focus on the formula, especially in the first video which used 'Ampun Bang Jago' song because the song wasn't in line with the topic and the screen become jedug-jedug." Another participant, Nadira, wrote, "The volume and the genre of some music distract me to focus on the way the lecturer computes the numbers in Excel, e.g Bang Jago. I really cannot focus and follow the videos." When developing the tutorial videos, we selected upbeat songs in the TikTok app to reduce the learners' statistics anxiety [23] and help boost the learners' motivation [24] in learning machine computation by means of Excel.

The songs were very popular in the app—as shown by the number of videos which used them—so it was expected that the learners also liked them and became more enthusiastic in following the tutorials. However, some learners turned out to consider them as a disruption rather than a motivation booster. The songs from certain musical genres drew their focus away from the tutorials and seemed counterproductive. Their preferred genres will be presented in the next section.

The last challenge that the participants reported was the absence of instructions in the videos. Rere, for example, mentioned "… there is no instruction explain the steps by using voice …" and Warti stated "…there is no explanation during the video, so I play it frequently to have better understanding" as the problem they faced in viewing the tutorials. Actually, the procedures of operating the statistical formulas in Excel were written in the Google Classroom posts, and they had read the posts before watching the tutorial videos. Apparently, some participants were auditory learners [25] so they could understand and retain the information in the tutorials if they listened to the instructions as well as reading and viewing the steps of the computation.

Feedback from the Learners

Suggestions about the TikTok tutorial videos in statistics classes included seven issues, three of which were related to the above challenges. Because many participants complained about the videos being too fast, most of the feedback was about the speed of the video. One of the participants, Desy, suggested, "It will be better if the speed of the videos is more slowly because not all students can master Excel quickly." Another participant, Clara, recommended a similar step by writing, "Perhaps if the speed of video can be set slower than the last video, but not too slow since it would be affecting the duration." Consequently, the videos should be improved by extending the length so there is no need to increase the speed. The tutorial should use a normal speed but the length of the video is within the three-minute limit set by TikTok app.

The second feedback was related to the backsounds in the TikTok videos. Although one participant enjoyed listening to upbeat songs in the video, the majority considered the songs disruptive and preferred other genres: instrumental songs, easy listening, calm music, and classical music. The genres share one thing in common, namely, slow beat. This important feedback must be taken into account because the effectiveness of the videos in motivating the learners to view them and learn further depends to a large extent on the music they hear. Even by using common sense it is safe to say that the learners tend to give up viewing the videos if they listen to music they dislike. To improve the videos, slow music should be used to adapt to the learners' taste.

Next, some participants suggested inserting voice that explained the process of the computation. For instance, Lydia wrote, "In my opinion, the video will be better if there's a verbal explanation in the video." Tatik even mentioned the reason for recommending it: "The videos must have voice not only texts and sounds, it would make easier to understand." Obviously for learners with auditory learning style processing the information through voice can improve their comprehension about the materials. The spoken instructions, then, should be inserted into the tutorial videos, which can be conveniently done in any video editor before uploading the videos to TikTok.

Fourth, the quality of the moving pictures in the video also invited feedback from the participants. To illustrate, Lala

suggested, "…better to keep the video in HD. Sometimes, the videos is not too clearly." Galih even elaborated the solution by writing, "Maybe [you] can record the video directly from the laptop, so that the screen can be seen more clearly than recording it from the screen using a cellphone." Indeed, the computations in Excel were shot by using a mobile phone, so the quality of the pictures was poor. To follow up this feedback, a screen recording app will be used in shooting video.

Another suggestion was related to the scope of video content. One of the participants, Mimi, wrote as follows, "I wish the video is not only about the computation part in Excel. Maybe the lecturer can also explain the mini research result using a short video to make us more interested in the process of analyzing the research data." The mini research she mentioned referred to the research we conducted in the classroom. The purpose of conducting the research was to put the theory they had learned into practice. For instance, after learning what Pearson r was and how to compute it manually, we administered a structured questionnaire to the undergraduates and asked them to complete it immediately. Then we analyzed the data obtained from the questionnaire by means of Excel and reported the results in a Google Classroom post in the same session. The report was brief yet complete, comprising the background of the study, the research question, the hypothesis, the research design, population and sampling, the research instrument, data collection, data analysis and findings. It was this post that Mimi would like to be presented in the form of TikTok video rather than only a written report in Google Classroom. In the future, the videos will not only give tutorials of machine computation, but also explain the whole procedures of research and its findings.

Finally, it was recommended by a participant that the link to the TikTok videos should be provided in the Google Classroom post instead of attaching the downloaded videos in the post. Bella suggested, "Maybe you can share your TikTok video's link instead of sending the video only, Ma'am, so that my friends and I can open it on your TikTok without download it first." According to her, it was easier to view the videos in the app due to internet connection problems. For other learners who have a TikTok account, it might be more convenient and stimulating to watch the original videos in the app. To follow up this suggestion, the link to the videos should be copied from TikTok and pasted in the Google Classroom posts.

Implications

The above findings suggest that educators do not need to hesitate using a popular app like TikTok as instructional media in their introductory statistics classes. The learners considered TikTok videos beneficial and motivating because they gained knowledge and computational skills through the type of multimedia that they liked. Because TikTok videos belong to multimedia which integrate text, sound, still images, full motion video, animation and computer graphics [26], these audio-visual aids can cater for different learning styles: both visual and auditory learners find them fruitful and stimulating.

Nevertheless, some challenges may arise in using TikTok videos in introductory statistics classes. Learners usually report a few problems after learning statistics through these videos. It is essential note that the learners' voice should be heard with open mind and followed up with solutions to improve the quality of the videos. Teaching is a journey, and encountering such problems along the way is quite common. Rather than viewing them as obstacles, statistics teachers should consider them as challenges to overcome for betterment. By the time the teachers continue their journey of teaching statistics, they have improved instructional media in their hand.

IV. Conclusion

The study attempted to elicit the learners' perceptions about the use of TikTok tutorial videos in introductory statistics classes, the challenges they had in using the videos as instructional media and their feedback. On the whole, their perceptions were favorable. They had very high opinion about how the tutorial videos assisted them in learning machine computation, but some features of the videos, however, received lower scores from the learners. The learners reported three features of the videos that made it challenging for them to follow the tutorials shown on the screen, i.e. the speed of the videos, the backsounds and the absence of audio instructions. Accordingly, they gave feedback about them to improve the comprehensibility of the tutorials. They also suggested better quality of the moving pictures, larger scope of video content and providing the link to the TikTok tutorial videos in Google Classroom. Despite the above challenges, TikTok tutorial videos are promising instructional media to teach machine computations in introductory statistics.

Only four tutorial videos were created by using TikTok app in the present study, so further research should be conducted to develop more tutorial videos to include the machine computation of all formulas taught in introductory statistics courses, such as chi-square and ANOVA. To make the teaching of statistics more learner-centered, it is recommended that the learners take active part in creating the tutorial videos. In addition to a development study as described above, an experimental study is also useful to compare the effectiveness of tutorial videos made in TikTok and similar video-based apps.

References

[1] S. Ko and S. Rossen, *Teaching Online: A Practical Guide*. New York: Routledge, 2017.

[2] J. Finkelstein, Learning in Real Time: Synchronous Teaching and Learning Online. San Fransisco: Jossey Bass, 2016.

[3] L. Dawley, The Tools for Successful Online Teaching. Hershey: Information Science Publishing, 2007.

[4] R. Huang, J. M. Spector, and J. Yang, Educational Technology: A Primer for the 21st Century. Singapore: Springer, 2019.

[5] B. G. Davis, Tools for Teaching. San Fransisco: Jossey Bass, 2009.

[6] K. E. Anderson, "Getting acquainted with social networks and apps: It is time to talk about TikTok," Library Hi Tech News, pp. 7-12, 2020.

[7] Q. Chen, C. Min, W. Zhang, X. Ma, and R. Evans, "Factors Driving Citizen Engagement With Government TikTok Accounts During the COVID-19 Pandemic: Model Development and Analysis," Journal of Medical Internet Research, vol. 23, pp. 1-13, 2021.

[8] C. H. Basch, J. Fera, I. Pierce, and C. E. Basch, "Promoting Mask Use on TikTok: Descriptive, Cross-sectional Study," JMIR PUBLIC HEALTH AND SURVEILLANCE, vol. 7, pp. 1-7, 2021.

[9] C. Hayes, K. Stott, K. J. Lamb, and G. A. Hurst, "“Making Every Second Count”: Utilizing TikTok and Systems Thinking to Facilitate Scientific Public Engagement and Contextualization of Chemistry at Home," Journal of Chemical Education, 2020.

[10] P. Escamilla-Fajardo, M. Alguacil, and S. L´opez-Carril, "Incorporating TikTok in higher education: Pedagogical perspectives from a corporal expression sport sciences course," Journal of Hospitality, Leisure, Sport & Tourism Education, vol. 28, pp. 1-13, 2021.

[11] A. A. H. Edwards, "From TED Talks to TikTok: Teaching Digital Communication to Match Student Skills with Employer Desires," Basic Communication Course Annual, pp. 336-341, 2021.

[12] H. v. d. Meij and P. Dunkel, "Effects of a review video and practice in video-based statistics training," Computers & Education, vol. 143, pp. 1-14, 2020.

[13] J. J. Perrett, "The Benefits of Using a Course Disk to Aid in the Instruction of Statistics Courses," Journal of Statistics Education, vol. 18, pp. 1-21, 2010.

[14] T. A. DeVaney, "Impact of Video Tutorials in an Online Educational Statistics Course," MERLOT Journal of Online Learning and Teaching, vol. 5, pp. 600-608, 2009.

[15] D. Ary, L. C. Jacobs, and C. K. Sorensen, Introduction to Research in Education. Belmont: wadsworth, 2010.

[16] G. Lai, Z. Zhu, and D. Williams, "Enhance Students' Learning in Business Statistics Class Using Video Tutorials," Journal of Teaching and Learning with Technology, vol. 6, pp. 31-44, 2017.

[17] D. S. Moore, "The Place of Video in New Styles of Teaching and Learning Statistics," The American Statistician, vol. 47, pp. 172-176, 1993.

[18] P. Petocz, "Effective Video-based Resources for Learning Statistics," presented at International Conference on Teaching Statistics, Singapore, 1998.

[19] Kusumarasdyati, "Statistical Reasoning or Statistical Method: Students' Preferences for Learning Statistics," Journal of Physics: Conference Series, vol. 1417, pp. 1-5, 2019.

[20] I. Gal and L. Ginsburg, "The Role of Beliefs and Attitudes in Learning Statistics," Journal of Statistics Education, vol. 2, 1994.

[21] J. R. Alldredge, H. D. Johnson, and J. J. Sanchez, "Does Viewing Video of Statistics in Action Affect Student Attitudes?," presented at International Conference on Teaching Statistics, Bahia, 2006.

[22] R. Heinich, M. Molenda, J. D. Russell, and S. E. Smaldino, Instructional Media and Technologies for Learning. Upper Saddle River: Merrill Prentice Hall, 2002.

[23] L. M. Lesser, D. K. Pearl, J. J. W. III, D. M. Dousa, R. P. Carey, and S. A. Haddad, "Developing Interactive Educational Songs for Introductory Statistics," Journal of Statistics Education, vol. 27, pp. 283-252, 2019.

[24] L. M. Lesser, "Motivating with music," presented at Colorado Council of Teachers of Mathematics Conference, Denver, 1998.

[25] D. H. Schunk, Learning Theories: An Educational Perspective. Boston: Pearson, 2012.

[26] P. F. Velleman and D. S. Moore, "Multimedia for Teaching Statistics: Promises and Pitfalls," The *American Statistician*, vol. 50, pp.217-225, 1996.