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Computer Engineering Students' Views on Educational Use of YouTube Videos

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Abstract: Web 2.0 technologies have led to the development of social media platforms that enable users to produce and share their own content. YouTube is such a platform where people can deliver their video clips as well as watch and interpret what others have developed. This study aimed to reach the opinions of the computer engineering students about their YouTube usage profiles and the educational use of the videos published in YouTube. It was designed as a survey research. The sample included 100 undergraduate students from a state university in Turkey. According to the findings, most of the participants access the internet primarily from smart phone and interact with the internet for an average of 6.4 hours a day. The participants stated that YouTube was the most used social media (72%), they subscribed to channels that produce educational content (84%) and watched educational videos (99%). They use YouTube mostly for entertainment (84%) and academic (67%) purposes. They believe that YouTube videos have educational functions such as repetition, compensation, individual learning opportunities, and preparation for exams. No significant differences were found in students' views according to gender and grade level.

Keywords: Web 2.0, YouTube, Educational use, Engineering students, Opinions

Introduction

It has been observed that day-to-day development of technology affects education as well as affecting many other sectors. In today's world where science and technology are developing rapidly, it is no longer possible to transfer and memorize knowledge with traditional teaching methods (Yavuz & Coşkun, 2008). With the developing technology, it is necessary to train qualified manpower to be needed and to integrate new technological knowledge and experience into education (Öztürk & Akgün, 2012). Therefore, many educational institutions have sought to design and implement new models that will meet the needs of students of 21st century (Klopfer & Ark, 2009).

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Web 2.0 technologies have increased the relationship between technology and people in an interactive way (Alp & Kaleci, 2018). Unlike Web 1.0 technology, Web 2.0 technology enables users to upload, produce, share and discuss information. It supported to the emergence of social media, which joined the social networks in which individuals are naturally included (Arklan ve Rençber, 2017). It has taken its place as the most original, strongest and popular communication channel presented by the new media within the framework of its own qualities (Göker, 2015). Studies show that people use social media for a variety of purposes such as research, collaboration, communication, sharing content, and entertainment (Usluel, Demir & Çınar, 2014).

Video sharing sites, which emerged from the idea of sharing motion pictures created by people with their own means, gained a popular place with the ability to search and display videos for site visitors all over the world (Emiroğlu, 2007). Founded by Chad Hurley, Steve Chen and Jawed Karim, YouTube is one of the most popular social media platforms, where users share videos, watch and comment on videos (Alleyne, 2008; Yıldırım & Özmen, 2011). Web 2.0 technologies such as Blog, Wiki, YouTube create new demands on learning and provide new support to learning (Duffy, 2009; Flynn-Wilson & Reynolds, 2021; Kelley, 2021; Shukla & Mcinnis, 2021; Yerdelen, Osmanoglu, & Tas, 2019). YouTube can help educators teaching information from all parts of the world using videos as a pedagogical resource (Duffy, 2008). Unlike other social media platforms, YouTube has a network structure that tries to support users to learn from each other (Skiba, 2007). At the same time, it creates a virtual library environment by providing users with access to many videos (Conway, 2006). The aim of this study is to reach the opinions of the computer engineering students about their YouTube usage profiles and the educational use of the videos published in YouTube.

One can subscribe to video sharing sites and upload their own videos as well as watch all videos without signing up (Bostancı, 2010). YouTube can be either visited as a website or installed as an application on operating systems used by mobile devices. When users get an e-mail account from the e-mail services such as Google Company, they automatically get an account from YouTube. As a result of literature review, it is seen that YouTube is not used for a single purpose but rather for a variety of purposes including increasing the knowledge and experience, evaluating their free time, following the popular, producing and sharing own content, interacting with other people, having fun and so on (Arklan & Kartal, 2018).

According to statistics by Alexa (2019), YouTube is the most visited social media site in Turkey just like in all over the world. An infographic data by Social Media Today shows that as June 2019 Youtube has more than 1.9 billion active users per month and over one billion hours of video are watched on YouTube every day (Daneghyan, 2019). Youth Insight, which conducts research on youth, carried out a study to investigate the behavior of young people on social media and to define the dimension of the relationship they establish between them. The study sampled 1000 participants from 7 geographical regions, 500 of which were high schools and 500 universities and showed that participants spent 50 hours a week (25 in weekdays 25 in weekend) on social media (MediaCat, 2011). YouTube is active in more than 91 countries and is the world's second largest search engine as well as the site with the most network traffic after Google (İçözü, 2019). All these statistics show the

popularity of YouTube in the world. When looking at the demographic characteristics of the users in 2019, more than 50% of the YouTube viewers are women, 59% of the users between the ages of 16-24 increased their use of YouTube compared to 2018, and 46% of the users between the ages of 25-34 (İçözü, 2019).

Video is the most important tool to provide records for events that take place, and to review and analyze these records repeatedly (Tan & Towndrowb, 2009). YouTube provides educators with a pedagogical resource that aims to teach information from all parts of the world through videos (Duffy, 2008). As a result of the literature review, it is seen that YouTube-supported education is widespread in the field of medical education and studies have been carried out in this field. Rössler, Lahner, Schebesta, Chiari and Plöchl (2012) expressed their opinion on the preparation of higher quality and institutional medical learning videos by making video quality reviews of lumbar function and spinal anesthesia concepts taught with videos on YouTube. YouTube has been used as an educational material in other fields besides medical education. Almurashi (2016) stated in an experimental study at Taibah University that YouTube played a leading role in helping students understand the English language. McAlister (2014) recommends using YouTube for occupational therapy instructors seeking innovative ways to improve their courses because of low cost of producing digital videos and uploading to YouTube is low. In the literature, YouTube was used as a course material in the field of Engineering education and Computer Engineering education. For example, Carlisle (2010) uploaded videos of 21 lessons to YouTube in order to prepare students for the Java lesson and applied a questionnaire to the students about how often they watched the videos and how much this activity contributed to their learning. As a result, the students stated that the video materials helped them learn. In the study, it was revealed that the students also performed successfully in their exams thanks to the video materials. It was concluded that the videos on YouTube can not only be a course material, but also a simple introduction or advertising for the university.

Method

The aim of this study is to reach the opinions of the computer engineering students about their YouTube usage profiles and the educational use of the videos published in YouTube. Therefore, the research was designed as a survey within the quantitative research paradigm. Survey research scans the whole or part of the population in order to reach a general judgment (Karasar, 2012). The sample of the study was composed of 100 undergraduate students (72 male 28 female) studying in the Department of Computer Engineering at the Süleyman Demirel University, Isparta, Turkey. A questionnaire was developed to collect the data consisting of participants' demographic features, their use of the Internet and YouTube, and their goals and opinions regarding the use of YouTube for educational purposes. Items were adopted from similar studies in the literature exploring students' view and behaviors towards videos shared on YouTube and purposes of watching YouTube (e.g., Alp & Kaleci, 2018; Lai, 2013). In the questionnaire form, a total of 10 items were asked to collect data about the participants' use of YouTube for academic purposes and the participants rated them using a 5-level Likert-type measure where "strongly disagree=1" and "strongly agree=5".

Results

Regarding demographic characteristics of the participants, 72% of them were male and 28% were female students. The reason why females are less than males may that the expectation of competence in being successful in professions and higher education programs in which men are the majority differs according to gender (Bozgeyikli, 2005). The participants were equally distributed according to their class levels, %25 for freshman, sophomore, junior and senior. The ages of the participants varied between 18 and 33 and the mean age was 21.94 years (SD=2.82).

It was observed that 72% of the participants used a smart phone as the primary device to access the internet. This finding indicates that the participants can access the internet from anywhere at any time. When looking at the daily internet usage of the participants, it differed from 2 hours to 18 hours with an average of 6.40 hours (SD=3.48). As far as their YouTube behaviors were concerned, 72% of the participants mostly used YouTube compared to social media platforms. 84% of them were subscribers to YouTube channels that produce educational content. Only one participant (1%) reported that he/she did not watch educational videos via YouTube. According to the frequency of their visits to YouTube, 57% of them used it much and 17% of them used it very much. It was revealed that 84% of the participants' purpose of visiting YouTube was mostly watching the videos of others for pleasure and entertainment. More than half (67%) also visited YouTube for learning and academic purposes.

Table 1. Participants' Views on Educational Usage of YouTube Videos

Opinion	**Mean**	**SD**
Being able to repeat the subject I do not understand in the lesson with the videos on YouTube as many times as I want helps me to understand.	4.14	.92
I get support from YouTube videos while working for midterm and final exams.	4.13	1.02
Videos on YouTube help me understand the subject.	4.07	.75
I get the opportunity to learn at my own pace with the videos on YouTube.	4.01	.83
I try to understand the subject that I do not understand at school by watching the videos on YouTube.	3.95	.90
I can learn a lesson I have not taken at school by watching YouTube videos to improve myself.	3.92	.91
I think my success level has increased thanks to the videos on YouTube.	3.61	.94
I can learn what I have learned from videos on YouTube by reading a book or articles on a computer screen.	3.42	.98
I find videos on YouTube boring.	2.41	.95
I find learning from YouTube videos unnecessary.	1.59	.92

Not. Scores from 5-point Likert scale ranging from "1=strongly disagree" and "5=strongly agree".

Table 1 demonstrates the opinions of the participants on educational usage of YouTube videos. On average

participants agreed with the statements like "Being able to repeat the subject I do not understand in the lesson with the videos on YouTube as many times as I want helps me to understand" (Mean=4.14, SD=.92), "I get support from YouTube videos while working for midterm and final exams" (Mean=4.13, SD=1.02), "Videos on YouTube help me understand the subject" (Mean=4.07, SD=.75), "I get the opportunity to learn at my own pace with the videos on YouTube" (Mean=4.01, SD=.83), "I try to understand the subject that I do not understand at school by watching the videos on YouTube" (Mean=3.95, SD=.90), "I can learn a lesson I have not taken at school by watching YouTube videos to improve myself" (Mean=3.92, SD=.91), "I think my success level has increased thanks to the videos on YouTube" (Mean=3.61, SD=.94), "I can learn what I have learned from videos on YouTube by reading a book or articles on a computer screen" (Mean=3.42, SD=.98) whereas they were undecided about the statement "I find videos on YouTube boring" (Mean=2.41, SD=.95) and they disagreed with the statement "I find learning from YouTube videos unnecessary" (Mean=1.59, SD=.92).

An exploratory factor analysis was performed to explore the factorial structure of the statements in Table 1. The scree plot of eigenvalues suggested a single factor solution. Since it is common in the literature to have a minimum of 0.30 factor loading, one item was removed and the remaining nine items, whose factor loadings differed from .46 to .85, were summed to create a composite variable to represent participants' overall opinion about the usage of YouTube videos for educational purposes (Mean=33.00, SD=4.67).

An independent-samples t-test was conducted to compare participants' opinions across gender (Table 2). There was no significant difference [$t_{(98)}$=1.40, η2=.01, p>.05] in opinions between males (Mean=33.42, SD=4.74) and females (Mean=31.96, SD=4.41). Similarly, a one-way between-groups analysis of variance (ANOVA) was conducted to explore grade level differences in participants' opinions (Table 3). There was no significant difference [F(3, 96)=.56, p>.05] in opinions among freshman (Mean=33.04, SD=5.23), sophomore (Mean=33.44, SD=4.63), junior (Mean=32.00, SD=4.56) and senior (Mean=33.56, SD=4.34). Participants' opinions were not significantly correlated with their ages (r=.07, p>.05) and daily internet use (r=.11, p>.05).

Table 2. Comparison of Participants' Opinion by Gender

Gender	N	Mean	SD	t	p
Male	72	33.42	4.74	1.40	.16
Female	28	31.96	4.41		

Table 3. Comparison of Participants' Opinion by Grade Level

Grade level	N	Mean	SD	F	p
Freshman	25	33.04	5.23	.56	.63
Sophomore	25	33.44	4.63		
Junior	25	32.00	4.56		
Senior	25	33.56	4.34		

Conclusion

Participating computer engineering students access the internet primarily from smart phones and highly interact with the internet on a daily basis. YouTube is the most used social media among the participants. They subscribe to channels that produce educational content and watch educational videos. They use YouTube mostly for entertainment and academic purposes. The students believe that the videos on the site have educational functions such as repetition, compensation, individual learning opportunities, and preparation for exams. Therefore, sharing the videos that educators will share with their students as an introduction or preliminary preparation on the YouTube website can make it easier for the students to come to the class prepared. Supporting the lessons via YouTube videos can give students the chance to listen to the lesson again and increase their success level. The quality of educational videos to be shared on YouTube will encourage the use of YouTube for academic purposes.

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