Engineering Students' Perception of Using Webcams in Virtual English Classes

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Abstract—Using webcams in virtual classes is considered as one of the most effective ways to build a sense of community and the quality of teaching and learning English through online lessons. However, whether to require learners to keep the webcams on for online learning has still been a controversial issue among teachers, learners, and administrators due to several problems. In the hope of providing a realistic view from engineering students in turning on webcams in online English lessons in higher education, this study was conducted to investigate engineering students' perceptions of using webcams in their online English lessons. A 30-item questionnaire and in-depth structured interview were designed to collect the data from 166 engineering students. The findings reveal that both students' and teachers' webcams were expected to be on only when necessary. In online English lessons, most students often turned on the webcams when required by teachers. Despite facilitating interaction and understanding between teachers and students, creating a feeling of closeness, and satisfying students' desires to see their teachers' faces, it is essential to consider the subject's distinctive features, students' worries about the device's slow speed, and concerns about distracting other students when requiring both students and teachers to turn their cameras on during online English lessons.

Keywords—engineering, English classes, perception, virtual, webcams

1 Introduction

Millions of students are affected by the prolonged school closures worldwide due to the ongoing COVID-19 pandemic. In an attempt to maintain the educational process, online learning has become an urgent solution that has been adopted by many schools at all levels [1], [2], [3], [4]. Accordingly, higher institutions have been required to organize distance courses as well as officially accept the results of those training programs. In early 2021, many primary, secondary, and high schools started to trial several distance classes in different subjects to finish their school-year programs on schedule. Several positive results have been recognized and that has led to the popularity of online classes as it does not decrease students' performance [5], [6], [7]. There are two main kinds of distance learning: streaming or broadcasting videos of recorded lessons on television and operating virtual classes through videoconferencing tools such as

Zoom, Google Meet, Teams, and so on. However, the latter appears to be more popular in higher education because of its outstanding features like multiple screen sharing, allowing two-way communication, or agility on-demand [8]. Despite the government's prompt and drastic policies to control the epidemic, several schools have been prudent to reopen due to the fear of health and safety issues for the teachers and students. Thus, more than ever before, learning online has been considered an inevitable solution to substitute traditional face-to-face classes in society these days.

Unlike on-campus classrooms which are easier for teacher-learner and learner-learner interaction, online classes have to face several problems caused by the limited interaction between the instructor and students as well as among students [9]. To tackle those problems, utilizing a camera in synchronous classes is considered an effective way to boost the quality of learning. It not only helps learners to have more chances to interact with their professors but also increases their motivation, concentration, and engagement better in classroom activities as well [10].

However, regarding engineering education in many Vietnamese universities and colleges, there has been no consistent rule about using the camera in virtual classes and it has been a controversial issue. On the one hand, many administrators and instructors would like their learners' cameras to stay on during the lessons to foster the connection between their peers and teachers. On the other hand, the advocates state that learners should be allowed to have their webcam off because of unreliable Internet connection, worries about privacy, and learners' financial inequities. Moreover, not all students feel comfortable being onscreen. Some of them just have their webcams on when they are requested by the teachers due to personal preferences or lack of confidence in appearance. Besides, there is a considerable difference among teachers in terms of webcam use during online lessons. Some of them turn on cameras throughout the lessons while others do not. Instead, they just let their cameras be on when they need to do that or choose to be behind the screen. Hence, when putting this issue into perspective, it has not been a compelling reason to require teachers and students to turn on or off their webcams in online training programs such as English or engineering classes. This study aims to provide a better insight into students' perception of using webcams in English virtual lessons that may help the administrators and educators to consider more appropriate ways in using cameras to improve the quality of engineering programs in synchronous online English lessons.

2   Literature review

Social development theory by Vygotsky (1978) has emphasized the central role of social-cultural context in cognitive development [11]. Accordingly, the learning process happens through social interaction with a more knowledgeable other to achieve higher mental functions within the zone of proximal development. A more knowledgeable other refers to a skillful tutor who has a higher level of knowledge than the learners in terms of certain tasks, concepts, or processes. Hence, it is not always the case that the more knowledgeable other is the teachers or older adults. In many circumstances, learners' peers, adult children or learning support systems using technology and electronic tools may be the ones who have more experience and knowledge. The zone of

proximal development is the region where learners are provided sensitive guidance through collaborative dialogues and then internalize the information to regulate their performance. Thus, interaction with a skilled partner can be considered one of the key factors to develop learners' competence and strategies.

In online learning and teaching, turning on webcams is considered one of the most effective ways to boost interaction which plays an essential role in promoting learners to actively engage in the lessons and get achievement in learning [12], [13]. Seeing partners' images can affect students' metacognition positively and facilitate the communication process [14], [15]. Many teachers and learners find it harder to interpret the interlocutor's ideas in the audioconferencing condition due to the lack of paralinguistic cues [16], which requires the instructors to do more to provide a warm and more effective learning environment.

In the context of the increasing use of video-conferencing platforms to conduct online classrooms, requiring students to turn on their cameras has been a controversial issue. On the one hand, turning on video cameras during online classes can be beneficial for both teachers and learners. First, it enhances nonverbal communication in virtual classrooms. Instructors can rely on their students' facial expressions and gestures to give an evaluation of their lectures and make crucial adjustments to enhance the effectiveness of the lessons [17], [18]. Besides, students whose connections with their peers have been deprived as a result of lacking social interaction can find it more productive to get involved in collaborative classes when they can see the interlocutor's images. [14], [19]. Second, turning on the webcam cannot only help to strengthen the interpersonal relationship between teachers and learners but also among learners in remote classes. They may feel closer and more comfortable interacting with each other due to developing a better rapport and a sense of community with the others in their class [27]. Finally, the camera can put the teachers in a more positive mood. Instructors may feel impersonal when working with a class in which learners turn off their cameras. Therefore, having cameras on helps them reduce the sense of isolation [20]. Also, teachers can better monitor and encourage the students to participate actively in the learning activities. It is believed that those can create higher satisfaction for teachers to sustain the positive teaching and learning environment in synchronous online classes.

In the language learning area, the impact of webcam use was found on some aspects of learners' competence. Regarding socio-cultural competence, a study that was conducted on 38 students who enrolled in the Conversational Skills Course at Al-alBayt University in Jordan revealed that webcam chat could enhance EFL learners' socio-cultural competence. Besides, it was proved to be supportive of learning receptive and productive skills as well as improving learners' proficiency, fluency, accuracy, and mechanics of speaking and writing [21]. In fact, students also had positive interactions with their friends, their teachers, and their lesson in online classes [22]. In addition, in order to enhance students' engagement, teachers used different ways such as online tools in their class, so the result showed that students' motivation and participation were positively fostered through webcams on video-conferencing systems [10].

On the other hand, keeping the webcams on can pose a range of challenges. First of all, when students are obligated to have their cameras on, it can violate the right of access, which is understood as the right to permit other people to access one's personal information and how it is approached [23]. Forcing students to turn on the camera can

cause leaking of the participants' images or information, not to mention the fact that other students may use whatever they see on the screen without permission. Second, camera use during class can create a psychological burden on students regarding personal anxiety and privacy [24]. Some students might feel shy to appear in front of people because of a lack of confidence in their appearance. Moreover, learners have to deal with the fear of being seen when they distract their attention from the lectures. Especially, being worried that someone may come into the background unintentionally or being concerned about the physical background behind them can cause learners immense stress during class time. In addition, many students may find their home life can be abusive in some way and that can impair their concentration. Another problem is related to financial issues and unstable Internet connections [25]. In Vietnam, the proportion of owning mobile technology that is used for studying is still low in comparison to other nations with moderate Internet bandwidth [26]. Hence, providing high internet quality to facilitate online learning needs to be taken into account more seriously.

It can be seen that previous research has focused on figuring out the benefits as well as the challenges of requiring students to turn on the webcams during online classes. However, there have not had many studies on students' perceptions of turning on the cameras in online English lessons in higher education. This study aims to fill this gap by finding out the answers to the following research questions:

1. How do engineering students like to turn on their webcams in virtual English classes?
2. How do engineering students want their teachers to turn on their webcams in virtual English classes?

3 Methodology

3.1 Participants and context

The population was 166 engineering students from a Vietnamese university, aged from 18 to 20 years old. Since engineering students had to study English as a compulsory subject in their first year, the study was carried out in their English classes for an engineering major. All participants had experience in learning online through Google Meet with English lessons in a semester due to the COVID-19 pandemic. A semester lasted 15 weeks. There were 3 hours per lesson and their English level of proficiency was around A2-B1 according to the CEFR framework.

3.2 Instruments

Based on the theoretical framework of social development by Vygotsky (1978) and previous studies, a 30-item structured questionnaire was designed by the researcher to investigate learners' desire of utilizing webcams in virtual classes. In other words, it was used to answer two research questions to see whether the participants wanted to turn on their webcams during class and whether they wanted teachers to turn on their teachers' webcams. The items in the questionnaire can be categorized into 3 main clusters: participants' background information (items 1, 2, 3), students' wishes to use their

webcams in English classes (items 4, 5, 6, 7), and how learners desire their teachers to use cameras during the class time (items 8, 9, 10).

Besides, several sub-clusters have been included: (1) the time when students often open the webcam (items 5a, 5b, 5c, 5d), (2) reasons for turning on their webcam (item 7a, 7b, 7c, 7d), (3) reasons for not having their webcam off (6a, 6b, 6c, 6d, 6e, 6f, 6g, 6h, 6i), (4) reasons why learners want their teachers to turn on the camera (item 9a,9b, 9c, 9d), (5) reasons why they expect their instructors to switch off the webcam (item 10a, 10b, 10c, 10d). Except for items about background information, participants have to choose between two options "Yes" or "No" for the other items. To reassure the validity and reliability, the questionnaire items were advised and revised by three experts who were the researcher's colleagues with experience in teaching engineering students for at least 10 years. Before administrating the questionnaire, it was piloted with the participation of 25 students and then analyzed by SPSS software version 25 for reliability.

In addition, an in-depth structured interview was also proceeded to learn more about the reasons why students want the webcams to be on or off to support the results of the questionnaire. The structured interview was employed conveniently compare and contrast the answers from the participants. The interview was structured with two questions:

1. Would you like to turn on the webcams in online English lessons? Why (not)?
2. Do you want your teachers to turn on their webcams in online English lessons? Why (not)?

3.3   Data collection procedures and analysis

Because of the different levels of English proficiency among participants, the questionnaire was translated into Vietnamese to make sure all of the items were clear and comprehensible for students. Because of the requirements to work online in the context of the spreading Covid-19 epidemic, the questionnaire was piloted on 25 students who have similar backgrounds to the participants in the current research through Google Form, a Google's web-based app. The Cronbach's alpha of .75 shows the reliability of the questionnaire. Next, the researcher made an appointment with the participants through Google Meet to explain specific terms as well as requirements in the questionnaire to make sure it was clear enough for all students. After that, the questionnaire was delivered to 166 participants through Google Forms. Then, the data collected from the questionnaire were computed and analyzed by the SPSS (version 25).

After that, nine students were invited randomly among the participants to take part in the one-on-one interview over Google Meet. First, participants were provided an interview guide which included the purpose of the interview, interview questions, time for the interview, and a link on Google Meet for them to join the interview. Any questions for clarification were answered to make sure all participants were available at the scheduled time and understood the shape of the interview as well as the questions. Second, in the interview, participants were asked some "get-to-know" questions at first to put them at ease. Besides, to make students feel most comfortable, they are allowed to choose to turn on or off their webcams and use Vietnamese or English to give their responses during the interview. With students' consent, the interview was recorded by

the QuickTime player app on the computer. Then, it was transcribed, manually coded, and inductively analyzed by theme which was based on the reasons why the participants wanted to turn their webcams on or off and why they wanted teachers to turn their teachers' webcams.

4 Results and discussion

4.1 Results from the questionnaires

Students' perception of turning on the cameras during online English lessons. Regarding learners' desire to use their cameras, as can be seen in Figure 1, a bigger number of participants want to turn on their cameras only when it is necessary (69.9%) compared to under a fourth of participants who like to have their webcams on during online English lessons. Only 6.0% of students choose to be behind the cameras in-class time.
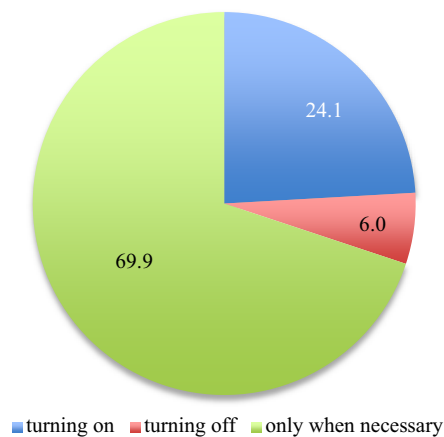

Fig. 1. How students like to turn on the webcams in online English classes

Table 1 shows that a great number of learners do not want to turn on their webcams until their teachers ask them to do that (*M*=.76). Many participants also recognize other times as checking attendance or talking to teachers as the second and third important ones to be in front of the cameras (*M*=.43 and *M*=.34 respectively). The least popular among the options is in listening and speaking classes (*M*=.25).

Table 1. When students open their webcams in online English classes

Items	Mean (M)	SD
When my teacher requires me to open the webcam	.76	.43
When my teacher checks my attendance	.43	.50
When I need to talk to my teacher	.34	.48
When I study writing and speaking skills	.25	.44

Table 2 reveals that each individual has different reasons to decide to turn on their cameras. Accordingly, enabling learners to interact more with their instructors and peers as well as focus more on the lessons are more common reasons which accounted for around a fourth of participants (M=.25). The second popular one is being able to create the feeling of participating in a real class (M=.23). However, just a few learners believed that being in front of the webcam can empower them to show their English ability (M=.07).

Table 2. Reasons why students want to turn on their webcams in online English classes

Items	Mean (M)	SD
I can interact more with my teacher and other students in class.	.25	.44
I have to pay more attention to my lesson because I know my teacher is observing me.	.25	.44
It makes me feel like I am studying in a real class.	.23	.43
I am more confident to show my English ability.	.07	.26

Similarly, the data from Table 3 indicates that there are many reasons for learners in order not to appear in front of the webcam during online English lessons. The most popular reason is that it can faster their device (M=.51). The second most important reason is that learners do not want their private space to be under any public disclosure (M=.38). The least common ones are not being seen when students do their work during class time and problems related to the devices that cause learners not to be able to turn on their cameras (M=.07 and M=.08 respectively).

Table 3. Reasons why students do not want to turn on their webcams in online English lessons

Items	Mean (M)	SD
Not turning on webcam can faster my device.	.51	.50
I do not want to show my private space in front of people.	.38	.49
I feel embarrassed if there is someone comes into my room while I am studying online.	.34	.48
I am not confident with my English.	.24	.11
I am worried that everyone will see my tired face.	.13	.34
My teacher does not ask me to open the webcam.	.16	.37
Turning on webcam is not necessary when I study reading or listening.	.11	.32
My device cannot turn on the webcam.	.08	.28
I can do my own work without being seen.	.07	.25

Students' perception of teachers' turned-on cameras. As can be seen from Figure 2, only a few participants (6.6%) prefer their teacher of English to have their webcams on all the time in class. Besides, the number of learners who would like to see their teacher on the cameras only when he or she talks to them is higher by 1.8% than those who want their professors' webcams to be off.
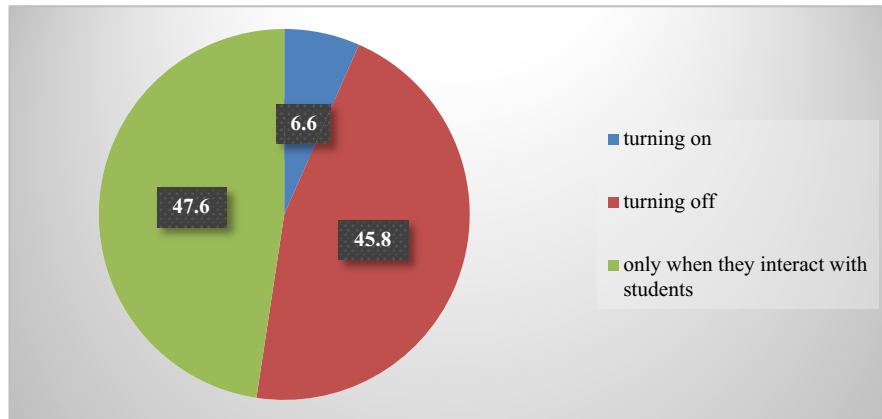
Fig. 2. How students want their teachers to turn on the webcams in online English classes

Table 4 explains the reasons why students like their teachers to have their webcams on. Accordingly, the stronger feeling of intimacy with the teacher ($M=.46$) is much more common than other reasons as a more interactive feeling with the instructors or imitating their mouth's shape to pronounce English ($M=.36$ and $M=.31$ respectively). In addition, the least popular reason is related to the confidence in talking to the teacher when learners see him or her on the webcam ($M=.15$).

Table 4. Reasons why students want their teachers to turn on the webcams

Items	Mean (M)	SD
I feel closer to my teacher.	.46	.50
I feel more interactive with my teacher.	.36	.48
I can imitate my teacher's mouth shape when they pronounce English.	.31	.47
I am more confident to talk to my teacher.	.15	.36

It can be seen from Table 5 that whilst not paying attention to listen to the teacher was proved to be the least chosen reason ($M=.09$), slow speed on the devices caused by having the webcams on is the most popular factor that can explain for not wanting the teachers' cameras on ($M=.23$). The desire to focus more on the lesson and personal anxiety are the second and third common reasons ($M=.14$ and $M=.11$ respectively)

Table 5. Reasons why students do not want their teachers to turn on the webcams

Items	Mean (M)	SD
Teacher's camera on can cause slow speed on the devices	.23	.42
I want to focus more on my lesson.	.14	.35
I feel worried because I feel like my teacher always looks at me.	.11	.31
I cannot concentrate on listening to my teacher.	.09	.29

4.2   Results from the interviews

The data from the structured interview reinforce the findings from the questionnaire and figures several other reasons why students want to be on and behind the webcams.

First, like the results from the questionnaire, many interviewees preferred to open the cameras only in some necessary cases. Four out of nine participants chose to be on screen when they needed to do that. A third of them like to let their webcams on during online English classes. The last two would like to be behind the camera.

Second, besides popular reasons which were mentioned in the questionnaire as facilitating the interaction, confidence to show English ability, feeling of studying in a real class or paying more attention to the lessons, other reasons were confirmed. That was improving understanding between teachers and learners due to seeing their body language and the instructors' better assistance to correct pronunciation errors. Five out of nine students shared similar reasons.

"*It helps me understand easily my teacher and my friends easily because I can see their facial expressions, behaviors, and body language while they are talking. Teachers can help me correct my mistake in pronunciation when he or she sees me.*" (Student 5)

Third, learners' worries about distracting other students was a remarkable reason besides the common concerns mentioned in the questionnaire that caused students to turn off the webcam in online English lessons as appearance, privacy, or technical problems as a third of the interviewees explained.

"*I am shy when someone is entering my room suddenly while I have my webcam on. Sometimes I am afraid that my appearance is not good enough to be in front of the camera. I am not very comfortable showing my personal space*". (Student 2)

A student said that:

"*My Wi-fi access is not strong enough to turn the webcam on*" and "*Other students can be distracted by my actions.*" (Student 1)

In light of the teacher's cameras, it was similar to the results from the questionnaire that having teachers' cameras on during online English lessons was a favorable thing for students. Eight out of nine interviewees would like their teacher to turn on his or her webcams during the online English lessons. One of the most popular reasons for that was a closer feeling with the teachers. Four out of nine participants claimed that they feel closer to their teachers. However, one of the interviewees preferred his instructors to be onscreen only in pronunciation and speaking lessons.

"*I just want my teacher to turn on his or her webcam in pronunciation and speaking classes because these subjects require students and teachers to interact more and I can imitate his or her mouth shape to pronounce English correctly.*" (Student 8)

It can be seen that the distinctive features of the subject can also be an important factor that impacts learners' decision to turn on or off the cameras in online English lessons. In addition, it is interesting to note that curiosity about the teacher's face was revealed to be another reason. Two out of nine interviewees shared their reasons.

"*I want to see my teacher's face so that I can recognize him or her in real life*". (Student 4)

It can be confirmed that turning on both learners' and teachers' webcams during online English lessons needs to be taken into account seriously. Several remarkable reasons for that taken from the interview are enhancing understanding between teachers and students based on body language, the instructors' better assistance, concerns about distracting other students, subjects' characteristics, and learners' desire to see their teachers' faces.

5   Discussion

This study revealed several important findings. Many learners are not willing to be on the camera all the time in online English classes. Instead, there are several times when students choose to turn their webcam on to take attendance, talk to the teacher, or study in listening and speaking classes. However, the most popular option is when it is their teacher's requirement. Regarding the reasons for having the webcams on, the findings of this study are consistent with the previous research which highlighted facilitating the interaction and understanding between teachers and students in classes, and creating students a sense of normalcy in classes [17], [18]. Besides, it is essential to note that several students admitted keeping the camera on makes them have more responsibility for their studies because not to mention other classmates' comments, their teachers would see if they are distracted by other things and can criticize and punish them. Thus, they have to minimize the urge to do their things and seriously engage in the lesson. Particularly, receiving better assistance from teachers in learning pronunciation and speaking was revealed as a remarkable reason for students to turn on the cameras in online English lessons. Hence, the specific features of the subjects can influence learners' decisions to turn on or off their webcams.

The current research is also in line with several studies in terms of figuring out the negative effects caused by turning on the webcam as slowing their devices, or worries about privacy and personal appearance are the main reasons that make learners hesitate to turn on the cameras [18], [26]. Moreover, distracting other students in class is another remarkable concern, especially when students have special backgrounds or do their private things during class time.

In addition, it is clear that a greater number of participants would like their teachers to have the camera on only when he or she needs to interact with them compared to those who want the instructor's webcam to be on all the time or off. Many students stated that keeping the professor's webcam on could make a more interactive environment in virtual English lessons, and easier to imitate the teacher's mouth shape in pronouncing English. However, creating a closer feeling with the instructor is the most outstanding reason. Besides, it is crucial to note subjects that require more interaction between learners-learners and learners-teachers were considered to be more encouraging for students to let their webcam on. On the other hand, a matter of some concern like unstable internet connection, less concentration on the lesson, or personal worries was reported. This finding is supported by some previous studies which emphasized several challenges related to the low quality of the Internet and privacy problems [24], [25].

6 Conclusion

The current study sheds light on engineering students' expectations of using webcams in virtual online English lessons. The findings emphasize that students' and teachers' cameras are expected to be on only when needed to do as required by teachers, taking attendance, talking to each other, or in listening and speaking classes. Features of the subjects are also a noticeable reason for learners to be onscreen besides the other main ones as having more effective communication, more responsibility for study, and closer feeling to the professors. Besides, it supports the previous results that privacy concerns, personal appearance as well as a weak Internet connection are the primary barriers to keeping the cameras on. Thus, school administrators and teachers need to take requiring learners to turn on or off their webcams in online English classes into account seriously to help students at the most comfortable as well as ensure the effectiveness in teaching and learning. Particularly, teachers themselves should be more sensible to decide when to turn on or off their webcams because it does facilitate not only their teaching process but also is a key to building a more friendly learning environment in online English lessons. The findings also suggest some pedagogical implications for all teachers in general, and engineering teachers in particular. Further research can get insight into the effectiveness of using webcams in learning different English skills or other subjects in various contexts.

7 Acknowledgment

8 References

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