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DOI: 10.1109/HORA52670.2021.9461390

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Efficacy and Acceptance of Virtual Classrooms During COVID-19: Bangladesh Perspective

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Abstract—The sudden spread of COVID-19 shut down educational institutions worldwide, and Bangladesh was no exception. Educational institutions were forced to start their activities online; there was no alternative to keep the students in the study. Although online education has been seen as part of a futuristic approach, its effectiveness and acceptability still remains questionable when it comes to institutional education. It's yet to be investigated if online education can be as effective as contact teaching. We conducted an online survey to determine what students feel about online classes, how they accepted online classes, and how useful it was for them depending on their current situation. Our survey was open to everyone who has taken online classes during COVID-19, and the number of participants in our survey was 210. The survey provided with both qualitative and quantitative data which were then categorized into themes for analysis. Findings suggest, that most students feel that by rethinking the class style, if teachers can provide well-structured lecture content and have an equal focus on all students, it can be an alternative for them during emergency days.

Index Terms—COVID-19, virtual class, online learning.

I. INTRODUCTION

When the coronavirus spread worldwide, communications were cut off; people were trapped at home, no one could afford it. Countries were collapsing economically; education was no exception. According to UNESCO, before mid-April 2020, 1.5 billion children and youth had been affected, and institutions in 195 countries were forced to close. Students went into a kind of captivity [1]. Students became mentally broken due to being at home for a long time. As a result, to keep students in study and stop the spread of coronavirus, educational institutions all over the world moved to conduct academic activities online [2]. After the emergence of positive COVID-19 patient cases in Bangladesh, the government had introduced a policy of learning from home through the Ministry of Education and the Ministry of Health and Family Welfare of Bangladesh, started in mid-March 2020 [3].

This sudden change in the education system when everyone was used to conducting classes from being physically present in the classroom, it had been possible to manage the education system digitally by using various online tools like Google Meet, Microsoft Teams, Zoom, etc. [4]. As the coronavirus has been around for more than a year, it is not yet possible to

confirm the vaccine for everyone [5]. Moreover, the number of coronavirus cases is increasing due to neglect. The education system can not go back to the way it used to be [6]. While the online class has overcome temporary setbacks, many are thinking about its effectiveness and acceptability. It has been running for more than a year; they are also wondering if the online class will continue after the coronavirus is gone. It is possible to determine the effectiveness and acceptability of an online class only by knowing the opinions and views of students.

This paper presents a study on the efficacy and acceptance of virtual classrooms among students from Bangladesh at the time of the COVID-19 crisis. Findings obtained from the study cause us to reconsider the types of improvements needed in the online education system. The online education system can be said to be a supplement to the traditional education system. As a result, it is now essential to attempt to resolve the system's limitations.

II. RELATED WORKS

The online class is an alternative to continue educational activities during these COVID-19 days. It is possible to achieve the proper purpose of education during this challenging time by ensuring the quality of education. Just as teachers need to rethink the new teaching tools and contents, students need to adapt to the new system. Only student-teacher collaboration and efforts can take education forward in these difficult times.

The online education system will be successful only when the students can benefit from it. Several researchers found that most of the students can take online classes quite easily, and they have no objection to taking online classes if the teachers can provide well-structured content and productive lectures [7]. Self-efficacy and expectations of ease of use and utility of online learning platforms have a favourable relationship [8].

There is a connection between the perceived utility of online learning systems and behavioral intention toward acceptance and satisfaction with online learning [8]. The impact of teacher characteristics (engagement, competence, and personality), student characteristics (collaboration, inspiration, and attitude), and the technology adoption model (The perceived utility and ease of use) to use e-learning and student acceptance [9]. One researcher stated that faculties must be trained to use

multimedia modalities and in designing lesson plans with less cognitive burden and more interactivity [10]. The importance of engaging sessions at the end of each class with quizzes and assignments to maximize the learning experience [7].

Owing to technological challenges, delayed responses, and the trainer’s inability to efficiently handle information and communication technologies, some students believe online classes are more difficult than traditional classrooms [7]. Lack of a seamless internet connection [11], Having no experience of online learning [12]; [13]. Surroundings can be noisy [14], it’s hard to be focused in an online class [15]. It is not possible to monitor all the students in the same way in an online class [16], feeling of loneliness [16], delayed feedback [17], to work in a group or have discussions with classmates [18]. Researchers in educational technology must direct study toward the development of alternative methods considering unbiased and equal assessment systems in the event of future epidemics [19].

We had seen that most researchers tried to find out how students are doing online classes and the teaching perspective of the teachers. However, there is very little work on the view of students on the efficacy and acceptance of online classes. Still, in developing countries like Bangladesh who face problems with internet connections and lack of digital devices on every hand, the acceptance and efficacy of online classes are not found out yet. As the length of the COVID-19 pandemic is becoming longer and longer, it will not be possible to go offline soon. The data we have collected and shown in this research will be helpful for educational institutions to take future steps on online education.

III. METHODOLOGY

A. Survey Design

A questionnaire was developed for determining student perceptions toward the efficacy and acceptance of virtual classes during COVID-19. It was a web-based survey using Google form, conducted during Spring-2021. A standardized and unstructured preliminary questionnaire was developed with the help of a literature review and informal conversations with students who participated in online classes [7]; [20]; [21]. Questionnaires were pre-tested by five persons, and their input was taken into account when creating the final questionnaire. We divided the survey form into four parts. The divisions are Demographic Information, Access to Virtual Classes, Virtual Class Platform’s Experience, and Overall. In the overall section, we arranged some questionnaires whose answer was quantitative ranged from “Extremely Unsatisfied - 1” to “Extremely Satisfied - 5.” Since everyone is more addicted to social media during this pandemic, we had tried to get the students’ responses through Facebook groups and pages of various educational institutions. We also tried to get answers through several messaging applications and Emails.

B. Participants

Since our purpose was to get feedback from students taking online classes, we looked at students from school,

undergraduate to postgraduate. Among 210 participants, 186 (88.6%) were from the undergraduate level. More than half of the participants are male, 142 (67.6%), and the females are 68 (32.4%). Participants aged from 10 to 50, where almost 195 (92.9%) are aged 18 to 25. We valued age in our survey because we wanted to see if there is an age difference when using applications to attain an online class or its benefits. The highest proportion of participants were from Urban areas 133 (63.3%), followed by Rural areas 43 (20.5%) and Sub-Urban areas 34 (16.2%). We wanted to know where the students lived to see if there was a variation in internet speeds depending on where they lived or any difficulty enrolling in the online session. We had tried to find out if there is any gender difference in joining online classes or taking advantage of online classes during this pandemic (see TABLE I).

C. Data Analysis

Our questionnaire was a set of quantitative and qualitative questions. As we tried to measure students’ perception towards online class, some questions were answered by “yes or no,” some were set to a linear scale of “1 to 5” where five is most satisfied, and one is least comfortable. And the rest of the questions were qualitative answer questions set with multiple choices, the options of multiple choice were set with default options. Respondents marked the options as they desired; for every single multiple-choice, we added a writing option where respondents added their opinions if any exists on that particular question.

We used Google Forms and Microsoft Excel data analysis tools to perform a percentage analysis and analyzed these qualitative and quantitative data. Two independent researchers were involved in analyzing and visualizing the data.

IV. FINDINGS

A. Access to Virtual Class

In the matter of joining the online classes, among the 210 respondents, 161 said they used Android smartphones and 14 used iOS smartphones, while 108 used Laptop Computers and 27 used Desktop Computers. It turned out that the majority used smartphones. 127 participants said they rely on mobile

TABLE I
DEMOGRAPHIC INFORMATION OF SURVEY PARTICIPANTS.

Demographic Information	Characteristics	# of Participants
Educational Level	High School	2
	College	7
	Postgraduate	15
	Undergraduate	186
Gender	Female	68
	Male	142
Age	33 to 40	1
	10 to 17	3
	26 to 32	11
	18 to 25	195
Residence Area	Suburban	34
	Rural	43
	Urban	133

data regarding internet access, whereas 108 on broadband and 36 on public WiFi. Among them, 115 (54.8%) participants reported seamless internet connectivity while 95 (45.2%) faced interrupted connection. About the online class experience, 176 (83.8%) respondents said that they had never done an online class before COVID-19, but 34 (16.2%) had experienced it. To attend online classes, the platforms they had used, Google Meet (163), Zoom (71), Facebook Live (11), Microsoft Team (6), Skype (2), and University's Blackboard (1) participants.

In online classes, 19 people said there were "no downsides." On the other hand, 143 respondents said it's "difficult to grasp lectures in an online class," 151 said it's "tough to stay concentrated in an online class for a long period," and 128 said it's "damaging to the eyes" to stare at a screen for too long. "It's impossible to have a decent interaction with the teacher," 107 respondents said, while 81 respondents claimed, "it's tough to concentrate since your surroundings are chaotic." Only two respondents offered their comments, which were: "Teachers are not very good at taking online classes" and "Students are sometimes too shy and lazy to ask the teacher to explain a certain topic that they do not understand."

We asked a question about the drawbacks of platforms to perform online classes. 60 people stated those platforms have "no disadvantages," whereas 76 people claimed, "data usage rate is higher." 37 respondents said "bad call quality," 38 respondents said "file transfer is not feasible," 29 respondents said "account is required," 43 respondents stated "limited access time and members." Three respondents wrote their thoughts, which were "sometimes the mic does not respond," "feature limits," and "need more features."

Regarding favorite styles of online classes, 146 (69.5%) respondents preferred "live class," whereas 64 (30.5%) chose "recorded classes" (see TABLE II).

B. Classmates Intercommunication

About the communication with new classmates, 150 respondents said they use social media / messaging groups and 91 use personal messages, while 60 respondents said they never communicate with new classmates. As a consequence, 167 (79.5%) respondents stayed "online class creates distance between classmates," but 43 (20.5%) respondents disagreed

with it. During this lockdown period, everyone is at home all day. In terms of studying habits, 34 respondents said they had not observed any changes, 118 respondents claimed "the stress of online classes all day has limited their study time," and 34 respondents said they had not watched any changes. "Study time has increased as compared to previous habits," claimed 33 respondents, while "the amount of time spent studying from online lectures and courses has increased," stated 84 respondents. Only 3 respondents provided their own opinions. Which are "Sitting at home, group study is not possible," "Studying online is of no clue unless we get the practical experience which can be done by doing physical classes," and "Yes, studying habit has changed."

C. Interactions with Teacher

In terms of interactions with teachers in online classes, how has that changed? 34 respondents stated "nothing has changed," 77 respondents stated "teachers have become less concerned toward students," and 61 respondents stated, "email communication with instructors is ineffective." 125 respondents said "students can not meet with teachers physically, which has a bad effect on the education system," 97 respondents said, "feel less motivated to discuss the topics."

More than half of the participants, 115 (54.8%), spoke with their class teacher after class if they had any issues, whereas 95 (45.2%) did not.

D. Tests in Virtual Classes

Giving online tests, 65 respondents said they like it. 61 respondents said, "It's easy to attend from anywhere at any time," 36 respondents said "open book exams are easy compared to typical exams," 91 respondents said they do not like online tests. 99 respondents said, "As a result of open-book tests, which take longer to complete than the time given for the exam, teachers generate difficult problems." 44 respondents said, "Teachers take more tests than usual because of open-book exams," 70 respondents said, "teachers are not able to evaluate their efforts." And three respondents offered their thoughts, which included "Do not like it since there are a lot of network problems throughout the test, which affects results," "Asking more questions but offering less time," and "Asking more questions but offering less time." Due to issues with the internet or gadgets, it is often too late to acquire questions," "Assessment differs from instructor to instructor."

E. Distractions in Online Classes

In terms of distraction in online classes, 16 respondents said they do not get distracted. 144 respondents said they are distracted in online classes "if the class is longer." 57 respondents said they are distracted "because they are unable to sit with friends in class." 88 respondents said they are disturbed "because they are engaging in classes from home," 89 respondents said they are distracted "because they are falling asleep in the online class." And 2 respondents wrote their own opinions, and the opinions are "A lot of the time there is a noisy environment, having network problems created

TABLE II
TECHNICAL INFORMATION ABOUT JOINING THE ONLINE CLASS AND COMMUNICATIONS WITH NEW CLASSMATES.

Technical Information	Characteristics	# Responses
Used Devices	Tablet Computer	2
	iPhone/iOS Smartphone	14
	Desktop Computer	27
	Laptop Computer	108
	Android Smartphone	161
Internet Accessibility	Public Wi-Fi	36
	Broadband Connection	103
	Mobile Internet Packages	127
Used Platforms	University's Black Board	1
	Skype	2
	Microsoft Team	6
	Facebook Live	11
	Zoom	71
Communication with New Classmates	Google Meet	163
	Never communicate with them	60
	Personal Message	91
	Messenger and Social Media Groups	150

distractions,” “Excessive use of earphones puts pressure on the brain.”

F. Class Evaluation Preferred by Students

According to Fig. 1, There was a mixed reaction among students regarding the evaluation. According to some more students 65 (31%) than others, it would be great if the evaluation happened at the end of every week. But there are also a significant number of responses for other options like 52 (24.8%) reported that they liked evaluation at the end of every class, 49 (23.3%) said that they wanted evaluation at every class on the previous lesson, and 44 (21%) reported that they liked assessment at the end of the course.

G. Changes in Instructions and Lecture Materials

Teachers use PowerPoint slides and whiteboards in offline classes, but they use PowerPoint and Jam board to write in online classes. When asked if there are any differences between online and offline classes, 41 respondents replied “no,” 107 said “teachers spend less time teaching a topic,” 77 said “teachers take less feedback,” and 95 said, “teachers use less imagery to demonstrate a concept.” And 4 respondents wrote their own opinion, and which are as follows: “Campus is an important thing,” “Most of the teachers do not know how to take classes online,” “Most of the teachers do not use Jam board because it’s hard to write in it,” “Some teachers take classes as they wish, some teachers do not take classes on time,” “Online classes is not so much efficient for us.” About the changes in lecture materials provided by the course teacher. According to Fig. 2, on a Likert scale valued from 1 to 5. Where 1 was for no changes, 3 was for neutral, and 5 was for extreme changes. Almost half of the students were neutral 87 (41.4%). Of the remaining students, 21 (10%) said the lecture material changed remarkably, while 22 (10.5%) said it did not change.

H. Learning Through Virtual Classes

Students’ confidence in learning through online classes, using the Likert scale valued from 1 to 5, where 1 was for

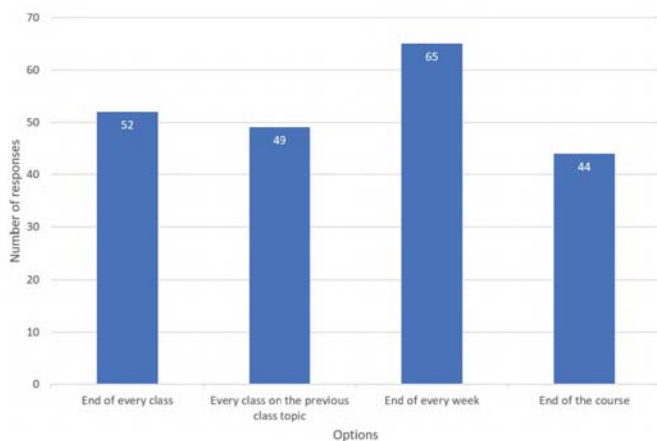


Fig. 1. Number of votes from participants about how they prefer to have their evaluation on class lectures and materials.

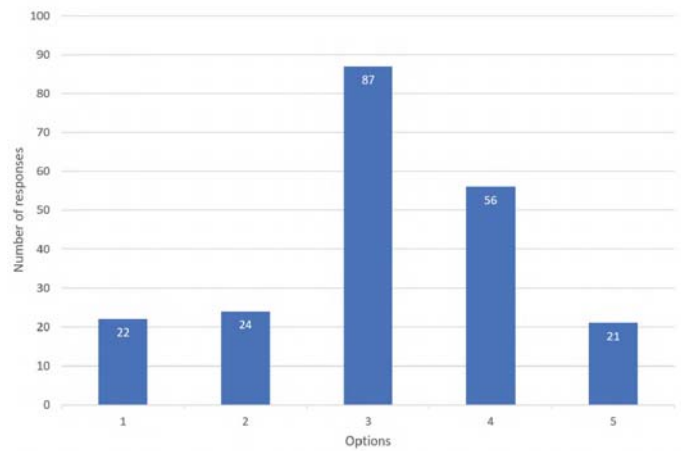


Fig. 2. Number of votes from participants about how instructions and lecture materials are changed.

unconfident, 3 was for neutral, and 5 was for highly confident, shown in Fig. 3. Although most were neutral 70 (33.3%), the number of fully confident students was 25 (11.9%), whereas the number of unconfident students was 36 (17.1%).

I. Student-Teacher Interactions

In the context of student-teacher interactions, using a Likert scale, valued from 1 to 5, 1 was extremely unsatisfied, 3 for neutral, and 5 for extremely satisfied. According to Fig. 4, 28 (13.3%) students were delighted, where 39 (18.6%) students were unsatisfied, and 58 (27.6%) students gave neutral responses.

In asking questions, 142 (67.6%) respondents said that if they did not understand a topic in the online class, they asked questions to understand it, whereas 68 (32.4%) said they did not ask questions. Among the respondents, 39 said “there is a similar tendency to ask questions as before.” 137 said, “when they do not understand something in class, they are more likely to learn from recorded lectures rather than asking questions.”

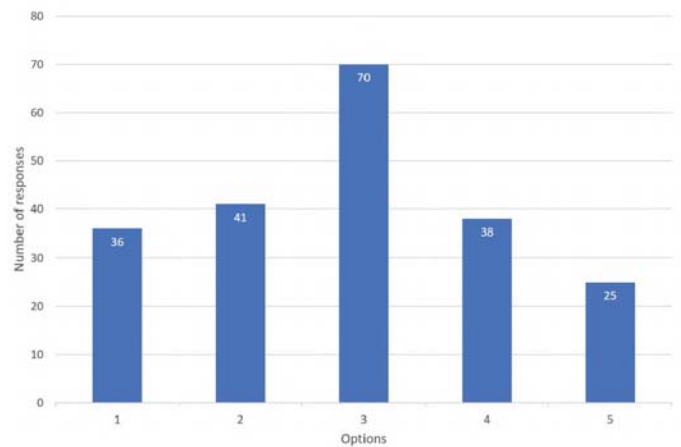


Fig. 3. Number of votes from participants about how confidence they are in terms of learning through online classes.

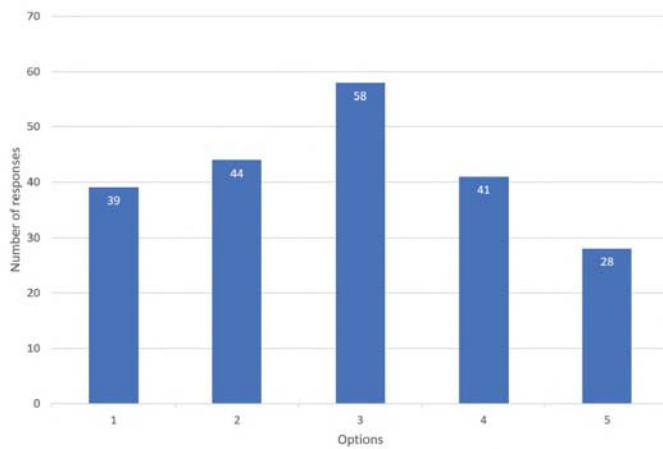


Fig. 4. Number of votes from participants about how student-teacher interactions are changed.

20 said “teachers simply avoid questions,” 13 said “teachers do not want to take questions,” 29 said “teachers only take questions from good students,” and 26 said, “teachers only take questions from good students.” And 1 respondent wrote his/her opinion. The opinion was “teachers do not understand well due to internet issues.”

J. Virtual Class Benefits

On the question of whether online classes are beneficial, most of the students were neutral. Using a Likert scaled question valued from 1 to 5, where 1 was very detrimental, 3 was neutral, and 5 was very beneficial. Fig. 5 confirms 66 (31.4%) students chose that neutral. 36 (17.1%) of students said online classes were very detrimental, and 29 (13.8%) of students said it was beneficial.

V. DISCUSSION

We have verified the efficacy and acceptance of online classes to enhance learning during the COVID-19 pandemic,

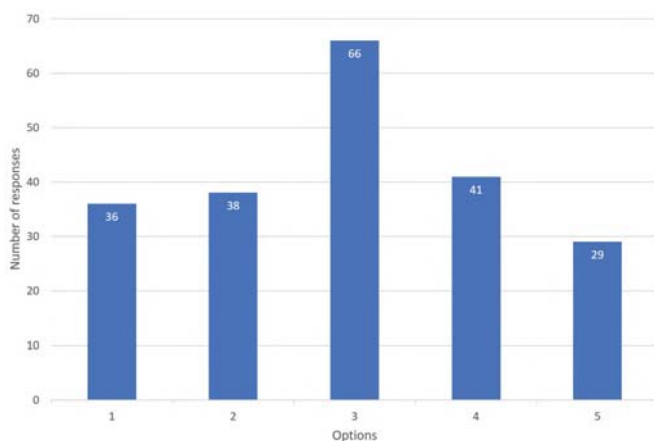


Fig. 5. Number of votes from participants about how beneficial online classes are.

and the outcomes were recorded in this research. Students’ viewpoints interpreted in this research reported that online learning modalities are scalable and effective sources of learning. We collected responses from students to understand whether they were sincere towards the online class or not and about the problems they identified in the online class. Through this data, it has been possible to know about the acceptability of the online class. On the other hand, through the information given by the students, such as how much they could learn in the online class, whether the teachers were providing quality lecture slides and some more information, it has been possible to determine the effectiveness of the online class.

The majority of participants declared that they have never done online class; they said it was difficult to understand lectures in the online class. Being focused for a long time was hard for them, and they also found that it was harmful to their eyes looking at the screen for a long time, whereas nearly half of the students found chaotic home environments which were unfit for the online class.

A lack of contact and engagement with their classmates led to a sense of alienation among the participants [15]. This study confirmed that ‘Online class creates distances with classmates’, mass participants stayed this. In online classes, communication with classmates is not as usual as it was in offline classes.

The Internet is a must-have for an online class; nearly half of the participants did not have an uninterrupted internet connection. Data is expensive, and the connection is weak; students face significant obstacles [11]; [22]. Participants stated that using those platforms accounts was mandatory and had limited access-time and members regarding platforms’ drawbacks.

About class style, most participants liked the live classes while very few liked the recorded lecturers. More than half of the students asked questions if they did not understand a topic, while less than half but not negligible respondents said they did not ask questions. There was a tendency to understand the lecture from the recorded video. In terms of the happiness of interactions with teachers, the majority of students were neutral. Since the students are aware that they will receive the recorded lectures, they do not pay attention during the live class [10].

Due to the more extended class period, respondents found them distracted. Noisy environment and network issues with delayed feedback created distractions. They said the home environment was not a suitable place for classes. In terms of online exams, researchers found students liked online tests, but our findings show that most participants did not like it, and they mentioned it was more challenging than offline tests [7].

Explaining a topic in online classes, most respondents found that teachers take less time explaining a topic and tend to use less imagery. They said that teachers need to be trained to take classes online. In the matter of changes of lecture material, half of the respondents find them neutral. Faculty must be taught how to use digital modalities and how to create lesson plans that are less cognitively demanding and more interactive [10].

Learning through online classes and its benefits, more than half of the respondents were neutral while nearly a quarter was confident and few were unconfident. The majority of participants said that there were many changes in their studying habits during this pandemic; with a lot of pressure for online classes, they found less time for study.

VI. CONCLUSION

The COVID-19 epidemic has forced all educational establishments, including schools, colleges, and universities, to perform their operations online to avoid causing damage to the education system. As a result of the situation forcing us to follow this scheme, students need to investigate the intent to use e-learning which will help verify online classes' effectiveness and acceptability. In addition, it will help us to make future decisions about online classes. According to the students' responses, advantages and disadvantages have been highlighted in the context of our study. Students recognize that the current situation does not allow for joining the classroom physically and express a willingness to embrace online classes. However, the students have added some conditions such as not taking classes for an extended period, using more pictures or illustrations to explain a topic, taking appropriate feedback from the students, checking them, and then taking necessary steps. There are also issues such as students using online platforms, using too much data, file transfers are not possible, time and number of students are constant, etc. The findings will help researchers determine what aspects influence a learner's decision to support this forced transition to online learning. This research also provides suggestions for teachers who have never worked with this type of learning before to make the process easier and more effective by understanding the factors that can help them engage students.

VII. ACKNOWLEDGEMENT

We are thankful to the anonymous reviewers for their feedback and constructive comments on this paper. We also thank to the individuals who participated the survey.

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