Google Classroom sessions as a modern e-learning tool for the second year undergraduate dental students – A questionnaire feedback study

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ABSTRACT

Background: With the advent of newer technologies in academic teachings, usage of e-sessions has increased to a larger extent. One such commonly used internet-based teaching forum is Google Classroom. It has certain distinctive features which makes its operation efficient for the students as well as teachers. It acts as a frontline for educative workflow and simple communication method for students. It facilitates enhanced learning along with teaching process, with being most advantageous to the students. However, there is a need to understand and evaluate the robustness and pitfalls of such methods. **Objectives:** The objectives of the study were to assess feedback of the 2nd year undergraduate dental students regarding sessions of Google Classroom as a modern e-learning tool. **Materials and Methods:** A feedback questionnaire consisting of 22 items was self-administered to perceive the opinions of undergraduate dental students regarding Google Classroom, through online medium. Considering $P < 0.05$ as statistically significant and at 95% confidence intervals, data were sorted and analyzed. **Results:** There were three domains derived – general domain, student-specific domain, and overall experience domain, wherein 90.5% of the students agree that Google Classroom can be considered relevant; as a new e-learning, 64.3% of the students rated their completeness of assignment submissions on Google Classroom as good and 72.2% of students responded that the knowledge gained from the Google Classroom sessions can be retained/ reproduced easily. **Conclusion:** The present study concludes that the undergraduate 2nd year dental students consider Google Classroom as a productive, efficient, and helpful modern e-learning tool for substantial studying and tackling exams in coronavirus disease-19 scenario.

KEY WORDS: Dental Undergraduate Students; E-learning; Google Classroom; Web-Based Teaching

INTRODUCTION

For continuing education and instilling a positive attitude among the students during this coronavirus disease (COVID)-19 scenario, it is necessary to maintain a constructive rapport and pragmatic approach of teaching and learning with the students. Thus, the different web-based methods can be used for the same. An example of this is; the sessions held on Google Classroom. Google Classroom sessions have been conducted for the 2nd year undergraduate students as a part of their teaching schedule in this lockdown period. However, their acceptability by the students is altered by various personal and professional parameters. Some of the parameters of importance are the fact that there is a knowledge gap between the contents and depth of coverage of topics on online classes as compared to traditional printed textbooks. Dental students' experience regarding the same has not been analyzed yet. Their opinions regarding the benefits and difficulties in coping up with such Google Classroom sessions have not been understood thoroughly.

Therefore, to understand the different factors involved, there is a need to assess the opinions and feedback of sessions on Google Classroom as a modern e-learning tool for the 2nd year undergraduate dental students.

In 2014, the notion of Google Classroom was initiated for educative learning. It has simplified and gained superiority by having efficient functions such as smooth method of distributing weekly/routine assignments to students and improving bonding and rapport of students with their teachers. Furthermore, it also provides scope of bringing in deadlines of work submissions which will thus compel and interest the students to finish their work within specified time period.[1] The teachers on their part can have a bird's eye view of every student and can keep a track of his academic activities and also emphasize on giving answer keys and comments to the sessions held by them.[2]

Google Classroom is now emerging as a student-friendly and self-competitive tool for all the educators and teachers. Many distinctive features make its operation efficient for the students as well as teachers. It acts as a frontline for educative workflow and simple communication method for students. It facilitates enhanced learning along with teaching process, with being most advantageous to the students. It's the teachers' responsibility to introduce the students to several such apps.[3] Google Classroom functions as a two-sided coin, wherein on one side, a unique directional process maintains the techniques and methodologies that the teachers' are comfortable with and, on the other side, the students perspectives, complete participation, and comprehension of knowledge can be evaluated in various classroom sessions skills. Worldwide, this tool is famous and its usage is continually growing on a daily basis.[4,5] The research studies[6-8] conducted in the past criticize that majority of the students feel good and believe that they are engaged appropriately in such sessions. Varied online platforms are considered as a teaching tool by many authors. However, none of the authors have performed any comparative studies. One such study was conducted by Kazi et al.[9] wherein the effectives of Facebook was evaluated as method of educative teaching-learning for the dental students. This study focused on the social media effectiveness in the overall performance of undergraduate 2nd year dental students. When considering comparison between Facebook (social media) and Google Classroom, there might be some limitations with Google Classroom.[10]

The abilities of Google Classroom to impact a student's study method are higher with increasing focus on his vocabulary. Moreover, with Google Classroom, the faculty could share course syllabus and learning materials to their students and they can access those anytime and anywhere.[11] This is the current need of the situation in terms of reinforcing education and knowledge in COVID-19 lockdown.

MATERIALS AND METHODS

The Institutional Ethics Committee and review board of the dental college gave necessary and appropriate permissions for the conduction of the study (IEC no-IEC/OUT/2020/10). This was a questionnaire feedback study with a cross-sectional study design, and the study population comprising the 2nd year undergraduate students in a dental college in Maharashtra.

The sampling method used was a census sampling. An Epi Info calculator for sample size (v.3.01) was used. The sample size was estimated using the "Sample size for Frequency in a Population" formula. With reference to a past prevalence study,[6] keeping the confidence intervals at 95% and the power of study at 80%; a final sample size of 79 students was derived. A selection criterion considered was, all the 2nd year students in dental college who were ready to give informed consent and willingly participate in the study were included in the study.

A feedback questionnaire used in the study was pre-validated and pre-tested. It comprised 22 questions. Out of these, five questions were open ended and remaining 17 were closed ended, which focused on the opinions and attitudes of the students regarding use of Google Classroom as an e-learning tool. Using Google Forms, the questionnaire link was sent to the students and they were asked to submit the feedback within stipulated time frame. After completion of the questionnaire, it was submitted back online to the primary investigator.

Statistical Analysis

Sorting and analyzing of the data were done in Microsoft Excel 2007/2013 with the help of Statistical Package for the Social Sciences software (v.21.0). Briefly, frequencies and percentages were calculated. To find out whether there was any significance within the parameters of the questionnaire, a Chi-square test of proportion was used.

RESULTS

There were 84 students who responded to the questionnaire. About 64 (76.19%) students were female and 20 (23.81%) were male. Our study questionnaire recorded overall 22 items out of which, 17 items recorded responses in the closed-ended format, whereas 5 items recorded opinions in the open-ended format. For ease of analysis and interpretation, the 17 items of questionnaire were divided into three domains – general domain, student-specific domain, and overall experience domain.

General Domain

The frequencies of the open-ended questions were analyzed and were categorized in various domains. Regarding the

responses in general domain, there were 88.1% of the students who were not familiar with Google Classroom, whereas about 90.5% of the students regarded Google Classroom relevant, as a new e-learning medium. About 83.3% of the students consider Google Classroom as an effective method of studying, but almost 10.7% were not sure of this. Lifestyle activities questionnaire (LAQ) was considered as difficult to complete by almost 71% of the students followed by short-answer questions (8.3%) and multiple-choice questions (7.1%). Google Classroom had a good coverage of the study topic as responded by 65.5% of the students and was considered user friendly by about 61.9% of the students. Statistically, the differences between the varied responses were significant, having $P < 0.05$ [Table 1].

Student-specific Domain

Student-specific domain consisted of all those questions whose responses varied from the student to student and had an individual perspective. About 75% of the students had faced internet connectivity or other technical difficulties only sometimes, whereas 20.2% faced them almost never. About 64.3% of the students rated their completeness of assignment submissions on Google Classroom as good while only 3.6% rated them as low. About 56% of the students responded that their doubts were cleared by the faculty and about 82.3% stated that they received feedback within time from their faculty regarding evaluation of assignments. Maximum number of students (78) used mobile phone to login for Google Classroom sessions. Statistically, Chi-square test of proportion was significant and denoted $P < 0.05$ [Table 2].

Overall Experience Domain

About the student's personal study experiences after submission of assignments, about 65.5% of students stated good, whereas only 1.2% stated poor. About 72.2% of students responded that the knowledge gained from the Google Classroom sessions can be retained/reproduced easily. Regarding the knowledge retained for a longer period of time as compared to lectures, about 38.1% of the students were not sure, whereas 32.1% were sure. Eighty-one students felt that the Google Classroom write-up can act as an answer bank for your future studies. These overall experience domains indicated that the students had good experience regarding the use of Google Classroom and found it relevant for their studies. There were significant ($P < 0.05$) differences inferred between varied responses of the questions [Table 3].

The responses of the open-ended questions were coded into five domains as per the questions. These questions were; "Do you face any difficulties in writing/completion of any parts of the assignments? Please specify and justify;" "Can you suggest any other web-based platform/portal for such educational activities;" "How can the Google Classroom session be made more interesting;" "Based on the assignment sessions conducted till now, can you give overall feedback;" and any feed forward for the faculty. The domains derived according to these questions were; most difficulties were faced in completing the LAQ's; no other web-based portals were known to work well for the students, except for zoom meetings portal; overall feedback assessed was good interactive helpful Google Classroom sessions in this COVID-19 scenario.

Table 1: Frequency (%) of the responses of closed-ended items in the feedback questionnaire (general domain)

Questions	Frequency – n (%) Total (n=84)		P-value
Google Classroom can be considered relevant; as a new e-learning	Disagree	2 (2.4)	<0.05*
	Do not know	6 (7.1)	
	Agree	76 (90.5)	
Ever used before; the Google Classroom web-based forum	Yes	10 (11.9)	<0.05*
	No	74 (88.1)	
Google Classroom as effective method of studying	Disagree	5 (6)	<0.05*
	Do not know	9 (10.7)	
	Agree	70 (83.3)	
Part of the assignments difficult to complete	MCQs	6 (7.1)	<0.05*
	SAQs	7 (8.3)	
	LAQ's	71 (84.5)	
Google Classroom assignments; in terms of depth of coverage	Good coverage	55 (65.5)	<0.05*
	Average coverage	29 (34.5)	
Web-based assignments user friendly	Very good	21 (25)	<0.05*
	Good	52 (61.9)	
	Average	11 (13.1)	

*P<0.05 statistically significant. LAQ's: Long answer questions, SAQs: Short-answer questions, MCQs: Multiple-choice questions

Table 2: Frequency (%) of the responses of closed-ended items in the feedback questionnaire (student-specific domain)

Questions	Frequency – *n* (%) Total (*n*=84)		*P*-value
Faced any problems due to interruption in internet connectivity or other technical difficulties	Sometimes	63 (75)	<0.05*
	Almost every time	4 (4.8)	
	Never	17 (20.2)	
Rate your completeness of assignment submissions on Google Classroom	Excellent	17 (20.2)	<0.05*
	Good	54 (64.3)	
	Average	10 (11.9)	
	Low	3 (3.6)	
Google Classroom method actually helps you practice for your examination	Yes	49 (58.3)	<0.05*
	No	4 (4.8)	
	Not sure	31 (36.9)	
Complete your Google Classroom assignments within stipulated period of time	Sometimes	25 (29.8)	<0.05*
	Almost every time	56 (66.7)	
	Never	3 (3.6)	
Doubts are discussed by the faculty	Always yes	47 (56)	<0.05*
	Often yes	30 (35.7)	
	Not sure	6 (7.1)	
	Often no	1 (1.2)	
Feedback within time from your faculty regarding evaluation of your assignment	Sometimes	14 (16.7)	<0.05*
	Almost every time	69 (82.1)	
	Never	1 (1.2)	
Device you login and complete your assignment	Mobile	78 (92.9)	<0.05*
	Laptop/desktop	4 (4.8)	
	Tab/iPad	2 (2.4)	

*P<0.05 statistically significant

Table 3: Frequency (%) of the responses of closed-ended items in the feedback questionnaire (overall experience domain)

Questions	Frequency – *n* (%) Total (*n*=84)		*P*-value
Personal study experience after submission of assignments	Very good	18 (21.4)	<0.05*
	Good	55 (65.5)	
	Average	10 (11.9)	
	Poor	1 (1.2)	
Knowledge gained from the Google Classroom sessions be retained/reproduced easily	Yes	61 (72.6)	<0.05*
	No	4 (4.8)	
	Not sure	19 (22.6)	
Knowledge retained for a longer period of time as compared to lectures	Yes	27 (32.1)	<0.05*
	No	25 (29.8)	
	Not sure	32 (38.1)	
Google Classroom write-up can act as an answer bank for your future studies	Yes	68 (81)	<0.05*
	Not sure	16 (19)	

*P<0.05 statistically significant

DISCUSSION

Our study highlights the need of understanding the usage of Google Classroom as a modern e-learning tool. It emphasizes on the feedback of the students received after attending such sessions. Their ease of usage, comprehension of the knowledge, and criticality in evaluation were all assessed in this study. The general domain signifies that the undergraduate education (UG) students felt that sessions on Google Classroom can act as a resourceful learning medium. The student-specific domain focusses on the fact that every student has a particular outlook about these sessions and has responded about the same, in the study. The overall domain explains the peculiar importance of these sessions, which aid as a good personal study element, as expressed by the UG students.

The COVID-19 pandemic and its disease transmission have affected severely the health of entire community and have

emerged as a public health problem.[12] The disease spread is so enormous and rapid that even though many infection control protocols have been laid down, it is difficult to control the transmission. Moreover, since there is restriction of the physical movement, following the social distancing norm, the dental students might face great difficulty in studying and tackling examinations in such scenario.[13]

Many literature studies have been performed on the different modes of online education and their comparison in the dental curriculum. However, pertaining to sessions on Google Classroom, there are limited researches; as its still evolving as an education method.[14] Globally, various authors have implemented these sessions for efficacious and productive teaching. One such study[15] has been done in Bangladesh province to appraise the rate of success of Google Classroom sessions for students as well as staff members. This study concluded that the only drawback of Google Classroom was the lack of two-way communication. Interaction is lesser when it is compared with other teaching methods. However, still, the students endured these sessions as compatible and undemanding. Similar results were found in our study, wherein the students responded that Google Classroom is a relevant effective method of learning and comparatively easier than other methods.

In the research studies[16,17] performed worldwide, the authors inferred that Google Classroom sessions have helped overcome the learning disabilities of students. Moreover, they will aid in performing social studies and also add value to the development of vocabulary of students, which, in turn, will guide them for a better performance at examinations. In spite of these advantages, one study has shown that there is still persistence of a knowledge gap between the online education methods and the traditional sources of education such as reading textbooks or routine physical classroom teachings. Such similar opinions are given by our students, wherein they are not exactly sure whether they can retain and reproduce the knowledge acquire from the Google Classroom. Another study[18] states that there is higher influence of the sessions of Google Classroom on self-directed education and learning of students. This has primarily affected their ability to express doubts, gain in-depth knowledge of particular subjects and is being able to comprehend the topics more effectively. Moreover, the peer pressure of competing and scoring high has also been reduced leading to a greater level of self-satisfaction. This view is supported by our study and other studies,[19,20] wherein through the technology of Google Classroom, the faculty members can interact with students based on their observations and analyze the overall demography of the students. Furthermore, the student-oriented classes and assignments can also be prepared by the faculty members for ease of students understanding.[21] The virtual teaching methods like Google Classroom can also be integrated with novel software's for productive results and thus aid in the educational success of students.[22] Overall,

very few research studies[23-25] have partially evaluated the strengths and limitations of these sessions to prove it more efficacious.

The involvement of the undergraduate students in the present study, only from the 2nd year, has been contemplated appropriate as these sessions were conducted for them on a regular basis. This enables them to have their best opinions and views about this feedback study. In their later academic years, they can develop interest in various research studies. These are the strengths of the present study. No assessment of comparison between different grades of academic years and further no control over the responses of the students confers to the basic limitations of this present study.

CONCLUSION

Our study results conclude that the 2nd year undergraduate dental students consider Google Classroom as a productive and efficient modern e-learning tool. They have shared their experiences, views, and opinions regarding the same and feel that further such sessions are useful for the personal studies and appear for university examinations. In addition, conduction of in-depth educational sessions can also be held for them focusing on primarily their difficulties and/or drawbacks in participation in Goggle Classrooms. Future cross-sectional studies with larger sample size can be carried out on comparisons of different web-based platforms/portals to determine the best which suits the students and teachers.

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