

# Between Teachers and Students in Online Teaching by Implementing Voice-Enabled Virtual Assistant in a Web Application Improves Interaction

Kajal Yadav

Research student, Department of Information Technology, B.K. Birla College of Arts, Science and Commerce (Autonomous), Kalyan

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**Abstract** - COVID-19 has led to increased online education by numerous apps accessible, at the same time, it gives birth to difficulties of the situation, internet, interaction, security, privacy between teachers and pupils. A virtual assistant is a software that works or provide services on the basis of user's commands. AI virtual assistant in web application with voice-enabled capability. This paper proposes the implementation of a virtual assistant in the web application in online education will increase the interaction between students and faculty.

## 1. INTRODUCTION

To decrease the workload of human being and increasing development in Artificial narrow Intelligence has led to the development of an AI virtual assistant. Various companies have developed virtual assistant like Cortana, Alexa, Siri. There are various types of assistant chatbots, voice-enabled assistant, humbots, etc. Application-based on virtual assistant helps the user to interact more effectively. Due to COVID -19, various colleges and schools have adopted online schooling. There are the various application for online teaching like Microsoft teams is a business communication platform and is in a family of Microsoft for business purpose and classroom for teaching, a webinar is used for online conferencing and for collaboration, the zoom is used for online communication, etc. Online teaching has merits and demerits. Merits are students can learn from any location and teachers can teach from any location without any need of infrastructure and travel cost at the same time. Demerits include the cost of internet, electricity and student's loneliness, less interaction. This research paper is focusing on finding the reasons for relation between among teachers and students in terms of interaction. It is important to increase interaction as student's future is at risk and it is difficult for teachers to handle the students in an online lecture. Various application has used a virtual assistant to improve their product quality. Using Virtual assistant in online lectures for improving the interaction because of voice-enabled feature helps the people. This research paper finds the relation between students, teachers attending or

teaching online lecture with the online education session interaction and students, teachers like to use app which has virtual assistant with people that would like to have virtual assistant in online education.

## 2. LITERATURE REVIEW

There are various work has been done on virtual assistant. The authors in [1] experimented difference between chatbots and humbots, implications for design of making chatbots. The authors in [2] developed virtual assistant programming language (VAPL) using deep learning and semantic parsers to translate natural language to VAPL code. The authors in [3] examined and proposed Artificial general Intelligence by using Global collaboration on AGI development and safety and global task force on AGI to monitor, delay and enforce safety guidelines. By coming up with the solution for actors (State, corporate, rogue) in AGI race. The authors in [4] experimented comparison between no voice AI, voiced AI, Embodied AI by using desert survival AR. The authors in [5] This research paper developed Conflicts resolution system in VR by using 1) Request Arrival Time Comparison module 2) Preference comparison module 3) profile comparison module. The authors in [6] proposed development of news application. The authors in [7] developed mobile game app for online courses using MyMOOCspace and the interaction between SPOC students has increased. The authors in [8] developed a virtual assistant for multi-user Smart home environment by using machine learning algorithm, saving in MySQL database and focusing mainly on case- based reasoned. The authors in [9] developed a virtual assistant using IBM Watson to help the students for campus. The authors in [10] developed a MIA (Most intelligent agent) for software engineers by using Natural Language Conversational Agent. The authors in [11] shows collaborative learning platform Microsoft TEAMS and the authors experimented teams by teaching language of Law. The authors in [12] shows due to increased online classes the privacy and security of teachers and students are at risk and compared it using zoom app. The authors in [13] developed a virtual assistant that processes data

and metadata using ML model and make decision using counterfactual decision. The authors in [14] developed a question-answering virtual assistant for students in 3

### 3. METHODOLOGY

Covid-19 has led to students and teachers to adapt to online learning, teaching respectively. So hereby I' am developing a questionnaire for students and teachers and finding out:

- 1) Relation between people attending online teaching and session interaction.
- 2) Relation between people attending online lecture without virtual assistant and wanted to have it in online teaching.

There are other methods for hypothesis testing but here using chi square test I further categorized it into null and alternate hypothesis. Chi square test looks out whether distribution of categorical variables differ from each other or there is a relationship.

By conducting questionnaire through google forms with population of 36 people including teachers and students collected all the information related to hypothesis that is population who are attending online lectures and that the interaction is interactive or not. It also included people who like to use voice controlled app (Virtual assistant) and those who want to have it in online teaching. On the basis of this Conducted hypothesis testing in two cases using chi square test.

Firstly put up observed result on the basis of observed result calculate expected result, then calculation of  $x^2$  and then find out the degree of freedom with that compare the tabular result at 0.05 significance level with the calculate one.

Due to pandemic it was difficult to collect responses by visiting student or teachers. So using google forms helped very much.

#### 3.1 Case1

Null hypothesis: There is no relation between online teaching and session interaction.

Alternate hypothesis: There is significant relation between online teaching and session interaction.

#### 3.2 Case2

Null hypothesis: There is no relation between people attending online lecture without virtual assistant and wanted to have it in online teaching.

Alternate hypothesis: There is significant relation between people attending online lecture without virtual

stages 1) used IBM Watson 2) developed VA from core 3) advanced development in VA by using semantic parsers.

assistant interaction and wanted to have it in online teaching.

### 4. EXPERIMENT

Here by conducting hypothesis testing in two cases:

#### 4.1 Relation between people attending online teaching and session interaction

Observed result:

Interaction /online lecture	Attend or Teach Online Lecture	Don't Attend or Teach Online Lecture	Total
Interactive	10	0	10
Not interactive	21	5	26
Total	31	5	36

Table-1: Observed Result

Expected result:

Interaction /online lecture	Attend or Teach Online Lecture	Don't Attend or Teach Online Lecture
Interactive	8.611	1.388
Not interactive	22.388	3.611

Table-2: Expected result

Calculation of  $x^2$ :

Observed value(O)	Expected value(E)	(O-E)	(O-E)^2	$\frac{((O-E)^2)}{E}$
10	8.611	1.389	1.929321	0.2240
0	1.388	-1.388	1.926544	1.388
21	22.388	-1.388	1.926544	0.0860
05	3.611	1.389	1.929321	0.5342
				Total= 2.2322

Table-3: Calculation of  $x^2$

$$\begin{aligned} \text{Degree of freedom} &= (\text{no of column}-1) * (\text{no of rows}-1) \\ &= (2-1) * (2-1) \\ &= 1 \end{aligned}$$

$\chi^2$  -tabular at 0.05 significance level is 3.841, at 0.90 significance level is 0.016  
 $\chi^2$ -calculated is 2.2322

#### 4.2 Relation between people attending online lecture without virtual assistant interaction and virtual assistant in online teaching to improve interaction

Observed result:

User of Virtual Assistant / Virtual Assistant in online teaching	Without VA online teaching is interactive	Without VA online teaching is not interactive	Total
Like to have Virtual Assistant in online teaching	04	24	28
Don't Like to have Virtual Assistant in online teaching	06	02	08
<b>Total</b>	10	26	36

Table-4: Observed Result

Expected result:

User of Virtual Assistant / Virtual Assistant in online teaching	Without VA online teaching is interactive	Without VA online teaching is not interactive
Don't Like to have Virtual Assistant in online teaching	7.777	20.222
Don't Like to have Virtual Assistant in online teaching	2.222	5.777

Table-5: Expected result

#### Calculation of $\chi^2$ :

Observed value(O)	Expected value(E)	(O-E)	(O-E) <sup>2</sup>	$\frac{(O-E)^2}{E}$
04	7.777	-3.777	14.265729	1.8343
24	20.222	3.778	14.273284	0.7058
06	2.222	3.778	14.273284	6.4236
02	5.777	-3.777	14.265729	2.4694
				Total= 11.4331

Table-6: Calculation of  $\chi^2$

$$\begin{aligned} \text{Degree of freedom} &= (\text{no of column}-1) * (\text{no of rows}-1) \\ &= (2-1) * (2-1) \\ &= 1 \end{aligned}$$

$\chi^2$ -tabular at 0.05 significance level is 3.841, at 0.90 significance level is 0.016  
 $\chi^2$ -calculated is 11.4331

#### 5. RESULT

Using a chi-square test on a hypothesis based on the response of the form got the result as:

**case 1:**  $\chi^2$  -tabular at 0.05 significance level is 3.841, at 0.90 significance level is 0.016 and  $\chi^2$ -calculated is 2.2322 it means that at 0.05 level alternate hypothesis is rejected and the null hypothesis is accepted and at 0.90 level alternate hypothesis is accepted and the null hypothesis is rejected.

**case 2:**  $\chi^2$  -tabular at 0.05 significance level is 3.841, at 0.90 significance level is 0.016 and  $\chi^2$ -calculated is 11.4331 it means that at both level 0.05 and 0.90 alternate hypothesis is accepted and the null hypothesis is rejected.

#### 6. CONCLUSION

In no of people given response for the questionnaire, it was visible people are facing trouble in online teaching due to various reasons, but this research paper is mainly focused on virtual assistant which helped to understand the based on chi-square test that people are not having interaction they used to have in the classroom.

So as per the result of the test, it is concluded students and teachers would love to have a virtual assistant in online teaching.

## 7. FUTURE WORK

According to the result students and teachers would like to have a virtual assistant in online teaching to improve interaction so in future develop an application for online teaching with virtual assistant keeping in mind that it will help to improve the interaction among students and teachers.

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