

Performance Analysis in Blended and Online Classrooms: An Experimental Study

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Abstract

The medium of instruction contributes to the achievement of learning outcomes. In this context, both blended and online modes of course delivery are practised widely in higher education. However, there is a lack of empirical evidence on which mode is more useful for second language acquisition. This study evaluates the efficacy of both these modes in a communication skills training course using a pretest-posttest design. Analysis of paired t-test revealed that the task achievement is significantly better in the blended mode when compared to the online mode. The study is expected to be practically useful to instructors who wish to leverage technology in second language classrooms. The strategies presented here can be applied to all disciplinary domains and therefore has broader relevance.

Keywords: blended instruction, online instruction, computer-mediated communication, pedagogy, assessment

Introduction

The approaches to language teaching have radically changed with the exponential growth of educational technology since the early 21st century. Warschauer and Kern have classified the evolution of CALL into three distinct phases. They are a) structural CALL - 1970s to 1980s, b) communicative CALL-1980s to 1990s and integrative call from the early 21st century. In the last phase, the evolution of multimedia and internet led to content-based ESL instruction. (2000).

First of all the conventional classroom environment does not offer scope for proficiency training in speaking skills. Secondly, the teachers are not able to monitor the students in the classrooms periodically even after providing necessary training. Thirdly, not all students have the confidence to practice an active skill like speaking in front of their peers. Finally, teachers have difficulty in evaluating students' speaking skills within the allotted time. Traditional classrooms are gradually replaced by multimedia classrooms to overcome these challenges. The use of technology has become indispensable for the teaching-learning process in universities across India. The University Grants Commission (UGC report, 2015) asserts that the onus is on universities to provide an excellent technological infrastructure for efficient learning outcomes. In this context, both blended and online learning are useful modes for second language acquisition. (Allen & Seaman, 2013) conducted a comprehensive survey of more than 2300 colleges and concluded that

both blended and online paradigms significantly contribute to the learning process. Although their study was rigorous in data collection and statistical analysis they could not conclude on which method of teaching is more effective. Therefore, the objective of this study is to determine which of these two modes is most useful for fostering communicative competency at the undergraduate level.

Spring, Graham, & Ikahihifo (2018) investigated the impact of blended and online learning on the cognitive and emotional engagement of adult learners. Their study is especially useful in the context of improving the learner's linguistic ability as both cognitive and emotional engagements are essential factors for developing oral communication. According to Garrison & Vaughan (2013), many universities are embracing blended and online learning strategies for enhancing the learning outcomes. However, they have not presented the learning analytics to conclude which is the optimal environment for language learning. Hegelheimer & Dursun, (2018) report that data mining in blended and online education has provided new insights into Computer Assisted Language learning (CALL). Statistics collected from online and blended learning show that intelligent tutoring systems determine the efficacy of learning (Tudini, 2018). There is a growing body of literature on both these modes of instruction. However, no previous research has investigated on speaking skills either in blended or online environments. This empirical study, therefore, aims to compare the efficacy of blended and online modes.

Tandoh, Flis, & Blankson, (2013) define blended learning as an amalgamation of (F2F) face to face and online training. Online education is an instructional model that is predominantly delivered online with no F2F aspect. (Cheng & Chau, 2016) define online learning as an instructional method in which all of the content is delivered through the internet. Although there are many operational definitions, it is not clear as to what exactly constitutes blended and online learning. The lack of consensus could be because the milieu and technological infrastructure differ from country to country. In the context of this study in blended instruction 50 percent of the content was delivered through the online mode and 50 percent through face to face. In case of online instruction, 100 percent of the content was delivered through the online mode.

Review of Literature

This section has three parts. The first part deals with seminal studies on blended learning and the second part deals with online learning. The final part deals with the research gap.

Blended Learning

Blended learning is a combination of traditional and technology-enhanced learning principles. Graham, Henrie & Gibbons (2014) investigated the pedagogies associated with blended learning. They reiterated three aspects that constitute blended learning such as a) blending online and face to face instruction b) blending different kinds of media and c) blending various methods. According to Wang, Han, & Yang (2015) blended instruction results in holistic development at five levels. They are i) facilitation of teacher's role ii) enrichment of content iii) technological support iv) academic support to the learners and v) institutional development.

Recent studies have evaluated the efficacy of blended environments in the context of language learning. Yamazaki (2018) explored the language learning ability in blended instruction. Her investigation revealed that the learners acquired communicative competence in technology-enriched learning spaces. The study reported a significant improvement in vocabulary and pronunciation. However, the sample size was small (n=11) which is a limitation of the study. Another recent study by (Tseng, Lin, & Chen, 2018) investigated the improvement of language acquisition in a blended environment. Their findings indicated that meaningful interactions take place in blended environments. There were 35 participants in his survey research, and all of them showed improved performance in language learning. However, the lack of intervention raises concerns about the validity of the findings. Brewer & Crano (2000) remark that experimental design is an appropriate design in educational research to compare two different approaches.

The seminal studies by Burston (2015), and Chiu (2013) provide empirical evidence of the efficacy of blended classrooms. Burston's study was a meta-analysis on 20 years of technology implementation which is inclusive of blended and online studies. Chiu's study was also a meta-analysis on computer-assisted language learning concerning vocabulary acquisition. Both these studies have reported on effective learning outcomes in blended environments. According to Deschacht & Goeman (2015), blended instruction reduces the burden of teachers and enables them to be innovative. They argued that it improves performance in adult learners. Surprisingly, they have reported that blended instruction increased dropout rates which are contrary to the findings of earlier research by Miller (2009).

Survey research by (Kintu, Zhu, and Kagambe, 2017) revealed that material design and technological quality were crucial elements in blended learning programmes. The survey results analysed through multiple regression analysis showed a high level of intrinsic motivation among learners. Costley and Lange (2016) carried out an empirical study on the effectiveness of blended learning in higher education. Their research indicated that instructional design in blended learning programmes increases learner satisfaction and positively affects the learning outcomes. The performance in achievement tests revealed the improvement of the learners.

Although these studies have reported on the positive impact of blended learning environments, there are a few studies that provide contradictory results. (Spring, Graham, and Hadlock, 2016) report that additional research is required to guide institutions in implementing blended learning. Graham et al., (2014) in his research synthesis on blended learning observes that the effectiveness of blended learning is not empirically proved at tertiary level. Their findings indicate that the efficacy of blended learning programmes is questionable. Hartwick, (2018) made a critical analysis of the previous studies related to Computer Aided Instruction (CAI). He conducted a comprehensive analysis of methods and data analysis techniques in blended environments. His research revealed that most of the previous studies have dealt with positive implications of blended environments. While highlighting the research considerations, he calls for robust data collection and analysis. Although previous studies have reported on test achievement, student satisfaction and better learning outcomes in blended courses none of the studies has reported on the effectiveness of blended environments for facilitating speaking skills.

Online Learning

Online instruction has received much attention in the last few years. Previous research has documented on online learning as a potential medium of learning and instruction. (Freitas, Morgan and Gibson, 2015) in their comprehensive review of Massive Open Online Courses (MOOCs) conclude that online instruction is transforming higher education. Palomeque & Pujola (2018) investigated on the online and multimodal environments for language learning at institutions of higher learning. They analysed the effectiveness of online and virtual platforms using a multi-layered multimodal method of analysis. They found that virtual environment improves linguistic ability and reduces communication breakdown.

Lin, Chen, & Liou, (2017) carried out a research synthesis related to Computer Assisted Language Learning & online instruction. They investigated 15 meta-analyses on online instruction published from 2003 to 2015. They found that online technologies provide the learners tremendous opportunities to sustain their enthusiasm over an extended period. Their meta-analysis shows that online mode results in deep learning. Bonk & Kim, (2016) carried out an exhaustive survey on online teaching in higher education. The results of their survey indicated that online education has led to significant technological and pedagogical changes. Bonk and Kim predict that online education will meet the demands of the language learners and would be a significant area of research in the 21st century.

Baran &Correia's (2009) research on online learning points out that facilitation among students is remarkable in online classrooms when compared to blended learning environments. They analysed the discussion threads of the students for evaluating the effectiveness of online programmes. Their study showed that the students exhibited a great interest and autonomy in learning when compared to teacher dominated classrooms. Other research studies that provide quantitative evidence of the effectiveness of online education are Davidson, Rasmussen, & Lowenthal, (2018). Flavin, M. (2016) &Johnson, et al., (2016).

While the studies mentioned above have shown a positive correlation between online instruction and learner performance a few studies have reported some limitations. Benton, (2018) argued that most of the studies on online learning have reported on the improved motivational level, attitudinal factors and other psychological variables. According to him the limited interaction between the peers and the instructors is a lacuna in the online mode of course delivery. Bikowski, & Casal, (2018) investigated the efficacy of online learning in higher education concerning language learning. Their studies suggest that most of the previous studies that claimed to be online were not exclusively online. They dealt with hybrid approaches. According to them, the pedagogies related to online instruction were not clearly documented. Most of the studies compared the modes of delivery and the level of student satisfaction. They did not examine the student achievement. They further claim that there is no consensus on the continuing debate between blended and online learning.

Research Gap

While there is ample evidence on the efficacy of both online and blended modes, there are only a few comparative studies on blended and online instruction. The notable ones are (Lim & Wang, 2016). Tsai (2015) and Vaughan (2007). These studies have concluded

that blended learning environments are more effective than online environments. However, these studies have adopted quasi-experimental or survey methods to compare blended and online learning. There was a lack of intervention and randomization in these studies. Hence the robustness of research on blended versus online learning can be challenged. George-Walker, & Keeffe, (2010) in their critical analysis of online and blended learning remark that these two domains will be potential areas of research in future as technology is in a constant state of flux. The review of the literature has revealed that a comparative study of online and blended learning in the context of facilitating speaking has not been investigated before. Therefore, this study aims to fill in this visible gap in the literature.

Theoretical framework

It is worthwhile to mention that this study has much relevance to 'Social cognitive theory' and 'Information processing theory'. These theories fit into the context of the study because the principles of these theories provide a basis for fulfilling the research objectives. Furthermore, they have substantial pedagogical implications in the context of blended and online learning. Hence these theories were used in the study.

Information Processing Theory

The theoretical framework chosen for the study is information processing theory and socio-cognitive theory. The fundamental tenant of the information processing theory is that humans process information rather than merely respond to stimuli. "Computers receive information, process the information and deliver the output. Human learning also constitutes these three premises. They receive input, indulge in learning activities and perform. (Libby, 2017, p.42). The extent to which the input is given would influence the learning process. Information processing theory emphasises the importance of learning environment. The information processing theory provides a strong rationale for this study as the instructional design is based on the tripartite principles such as delivering input, helping the learners to process information and perform in speaking tasks. The researchers used Edmodo as an (LMS) to provide input, initiate learning activities and to track their performance.

Application of Socio-Cognitive theory

Bandura (2014) defines socio-cognitive theory as a fusion of cognitive, behavioural and environmental factors that shape learning. The fundamental premise of the theory is that social diffusion and social networking positively affect the learning process. Another primary construct of this theory is self-directedness. (Bandura, 2003) describes this learning principle as collective efficacy. (Rubenstein, Ridgley, Callan, Karami, & Ehlinger, 2018) reviewed the role of socio-cognitive theory and its factors that influence creativity development. Their study focused on the teachers' perceptions of socio-cognitive theory. They found environmental support as the determining factor that leads to successful learning outcomes. The fundamental tenets of socio-cognitive theory and its application in the context of this study are presented in Table -1

Table 1

Application of Socio-Cognitive Theory

Using the Key Tenants of Socio-Cognitive Theory for Facilitating Speaking	
Principles	Classroom Activities
Social interaction leads to active learning	Students discussed using the learning management system- Edmodo
Multimedia resources shape learning	The instructor shared e-resources, video lectures and online quizzes
Self-Efficacy(Belief in oneself) enhances performance	The instructor shared the evaluation rubrics to help them understand the examiner's expectations.
Collective efficacy (Peer work and teamwork) leads to better learning	Pair work and group work was encouraged for completion of tasks.
Self-Directedness is a crucial element in the learning process	Students were asked to identify extra resources about BEC-Speaking and share the links in Edmodo.

As mentioned earlier, the researchers have applied the principles of information processing theory and socio-cognitive theory to facilitate speaking skills through blended and online learning.

Speaking Skills

According to Nakatsuhara, Inoue, Berry, & Galaczi, (2017) fostering communicative skill is the primary goal of second language acquisition. The oral communication skill course at Crescent Institute is structured to enable the target learners to interact convincingly in oral contexts such as expressing views, sharing opinions, giving a mini-presentation, initiating and responding. Proficiency in language skills is usually based on communicative competency. International exams give equal importance to all four macro skills namely listening, speaking, reading, and writing. L2 learners are usually apprehensive during speaking exams. Given this situation, it was felt that they needed proper training to communicate convincingly in speaking tests to clear international exams like Business English Certificates (BEC). Usually, the candidates are assessed on parameters such as grammar and vocabulary, discourse management, pronunciation and interactive communication. Hence it is imperative to train them in all these aspects. The tasks in blended and online programmes are intended to train the students in all the above-mentioned parameters.

Methodology

An experimental method was employed as it is a suitable method for intervention research. “The experimental research methodology usually involves truth-seeking (as opposed to perspective or opinion seeking) and it includes the use of quantitative methods for analysis. It is objective, valid and replicable”. (Gray, 2013, p. 6). Since this research study aims to compare the effect of the blended and online intervention on language acquisition this methodology was applied. These research questions were formulated to fulfill the research objectives.

Research Questions

1. Are there significant differences in the communicative competency in the pretest of blended learning group and pretest of online learning group before intervention?
2. Are there significant differences in the linguistic skills of the blended learning group before and after intervention?
3. Are there significant differences in the performance of the online learning group before and after instructor's online support?
4. Which mode is more useful for facilitating speaking skills? Is it blended or online mode?

Participants

This study, approved by the Institutional Review Board (IRB), was conducted at Crescent Institute of Science and Technology in Southern India. The environment of the institution suited the context of the research as both blended and online instruction were an integral part of pedagogical practice. In accordance with, IRB policies, all participants gave informed consent after learning the purpose, procedures, duration, and potential benefits of the study. 66 graduates were selected randomly from a representative set of 894 second-year students of Engineering and Technology. Out of the 66 graduates involved in the research 34 of them were randomly assigned to the blended learning environment and 32 of them were allocated to the online learning environment. In the former situation the students had the instructor’s intervention, and in the latter, they had to depend on the model provided in (LMS) and learn without teacher's face to face intervention. To maintain uniformity among the samples, the researchers chose 29 students from each group. The average mean of the participants is 18.7 for the online group and 18.5 for the blended group.

Both the groups were trained to take up the Business English Certificate (BEC) speaking test, preliminary level. The students were ESL speakers at B1 level. According to the Common European Framework of Reference (CEFR), the candidates at the B1 level are expected to be independent users of Language at threshold stage. The CEFR framework provides a list of statements that candidates at the B1 stage are capable of doing. They are i) understanding day to day functional language. ii) understanding the language encountered at work and school iii) producing connected text on familiar topics and topics of personal interest. iv) describing events, experiences and feelings with reasons. v) conversing on topics of personal interest. (P.24).

The candidates were trained to improve the speaking at four levels. They are i) enabling them to produce correct grammatical forms ii) training them to speak with proper

cohesion and coherence iii) helping them to articulate the sounds with appropriate stress and intonation iv) helping them to understand the nuances of interactive communication. The assessment rubric also measured this four criterion. The test components were in alignment with the training tasks. The test had three parts. They are 1. Responding to personal questions and expressing opinions. 2. A mini presentation on a business topic. 3. A Collaborative discussion on a speaking prompt. The same instructor taught all the three parts of speaking.

Steps in the study

A pretest-posttest approach is a suitable approach to measure the impact of the intervention (Bryman, 2016). As the researchers were interested in measuring the impact of blended and online intervention a pretest-posttest method was employed. A pretest was conducted to both group-A and group-B before the instructional phase. The pretest was diagnostic by nature. The students of group-A were allocated to blended instruction. The students of group-B were allocated to online instruction. The steps in the study are presented in the flowchart given. After the intervention phase, a posttest was administered. After the posttest, the performance of online and blended groups was evaluated using a paired sample t-test using Statistical Package of Social Sciences. (SPSS) .The steps associated with this study are presented in figure-1.

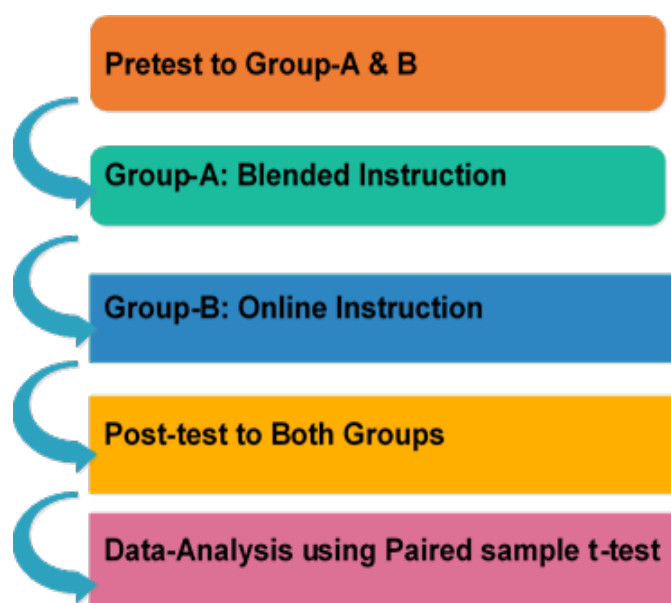


Figure 1. Steps in the Experimental Study

Pretest

The pretest scores of both groups were taken from two continuous assessment tests from the course on Oral Communication. It is a one-credit course offered during the third semester. Two instructors handled the course. The cumulative average of the two tests (presentation, and short interviews) was taken as pretest scores. Part-rating was followed. One instructor rated presentation, and another instructor rated short interviews. Inter-rater reliability was obtained using Cronbach's alpha. The Cronbach's alpha was at an acceptable level of >0.7 . The scores of the pretest indicated a homogeneity between

group-A and group-B. After ensuring parity, they were treated to blended and online instruction respectively. A detailed description of the pretest is presented in data analysis.

Posttest

Two raters rated the post-test scores. The average rating of both the assessors was taken for analysis. One rater used the analytic scale, and the other rater used the holistic scale. Analytic scoring refers to assigning individual scores to all subcomponents of the task. In this context the four components of analytic scoring are 1) grammar and vocabulary 2) pronunciation c) discourse management and d) interactive communication. (Appendix-1) In holistic scoring, the rater gave an overall assessment score for the speaking test. Rater-1 evaluated all four constructs for five marks each whereas, Rater-2 evaluated the total sum of all four constructs. The average scores of both raters were rounded up for 20 marks and taken for analysis. Inter-rater reliability obtained using Cronbach's alpha was at a reasonable level of >0.8 .

Blended and Online Instruction

Setting

The study was conducted for six weeks consisting of two instructional hours per week. The blended classroom comprised of a combination of face to face instruction, video streaming services, PowerPoint presentations and web-based tasks. Of the 12 hours, 5 hours was set aside for web-based instruction and 5 hours were spent on face to face instruction. Two hours were allocated for evaluation. The online classroom consisted of web-based technologies such as video streaming services, podcasts, video lectures, electronic reading resources, Slideshare presentations and online discussion boards. This study was conducted in adherence to the fair use guidelines of educational multimedia drafted by Consortium of College and University Media Centres (CCUMC). Copyright materials were not used. Permission to use web resources was sought wherever necessary.

Edmodo was used as an LMS for sharing resources and facilitating discussions. As a prerequisite for the course, the students were given a pre-training on Edmodo. The instructor uploaded the multimedia lessons and other learning resources through Edmodo. Though self-pacing is one of fundamental premises of online education, the students were asked to complete the speaking module in ten hours. The teaching materials were uploaded in Edmodo to enable students to learn from anywhere. They were also provided with a learning space in the multimedia language lab to access materials. The instruction took place predominantly in the multimedia language lab with ten hours devoted to online materials and two hours allocated to evaluation. The instructor checked the online discussions, commented on the discussion threads, clarified their doubts, and provided them feedback.

Schedule of Blended and Online Activities

Step-1

As mentioned earlier the students who were trained using blended mode were treated as group-A and students who were trained in online mode were treated as group-B. Group A had the instructor's face to face intervention whereas group B had to learn independently based on the inputs provided through Edmodo. Initially, the students of group-A were exposed to the format of Business English certificate speaking test. The instructor explained the importance of the course and the learning outcomes. The students of group-B were exposed to an introductory video lecture on the format of the speaking test. The screenshot of the instructor's video lecture is given in Figure 2.



Figure 2.Screenshot of the video lecture.

Step-2

A video lecture on the strategies of BEC speaking Exam was shared with both the groups through Edmodo. The video covered all three parts of speaking. The entire video lectures of the study are stored in Google drive, and the link is given below. <https://drive.google.com/file/d/0B9OJKEseqNAHSmdmYUdCVHIBSUE/view?ts=5922af95> After viewing the video, the blended learning group had a face to face quiz and an online group were administered the same quiz using Edmodo.

Step-3

Group A was trained using the corpus of business vocabulary given in the Cambridge edition of the textbook Business Benchmark. All the students had an individual copy of the textbook. After the task on business vocabulary, they were given handouts on functional language and prompted to perform in part one speaking. The same content was shared to the group-B using Edmodo. The link is given below. However, only the members of the classroom will be able to view the tasks. <https://www.edmodo.com/home#/group?id=24624856>

Step-4

During this stage, the instructor focussed on the grammatical resource. The students of group-A were instructed to do the exercises on the appropriate use of tenses from the

textbook. The students of group-B were exposed to only online exercises using the web link given. (<http://www.bbc.co.uk/skillswise/game/en32tens-game-tenses-treasure-hunt>). After the online tasks both the groups were provided with a reinforcement task on tenses. The tasks were created using 'Hot Potatoes', free software that enables the users to create interactive tasks and quizzes. Hot potatoes version six was used to create web-based exercises. It can be downloaded from (<http://web.uvic.ca/hrd/hotpot/>). The quiz had ten questions on the use of tenses. The screenshot of a sample task is given in Figure 3. After step three and four both the groups were given a rubric on grammar and vocabulary. (Appendix 1)

EXAMPLE:
The sun now. (*to shine*)

ANSWER:
The sun **is shining** now.

1 We TV when it started to rain. (*to watch*)

2 I to visit you yesterday, but you not at home. (*to want*)
(*to be*)

3 Look! It , so we can't to the beach. (*to rain*) (*to go*)

4 There are a lot of clouds! It soon. (*to rain*)

5 The sun in the east. (*to rise*)

Figure 3. Screenshot of quiz created using Hot Potatoes

Step-5

The students of group-A were shown video clips of test takers in Cambridge ESOL exams who had clear pronunciation and diction. The transcript of the videos and a pronunciation rubric was shared using Edmodo. (Appendix 1) After viewing the video clips, they were instructed to read the transcript of the videos for improving articulation. Stress and intonation patterns were also discussed. The students of group-B were exposed to video tutorials on improving pronunciation. The link to the video tutorials was posted in online classroom Edmodo. (<https://www.youtube.com/watch?v=UawwTSzaZzk>). The screenshot of a sample task used in the classroom is given in Figure 4.

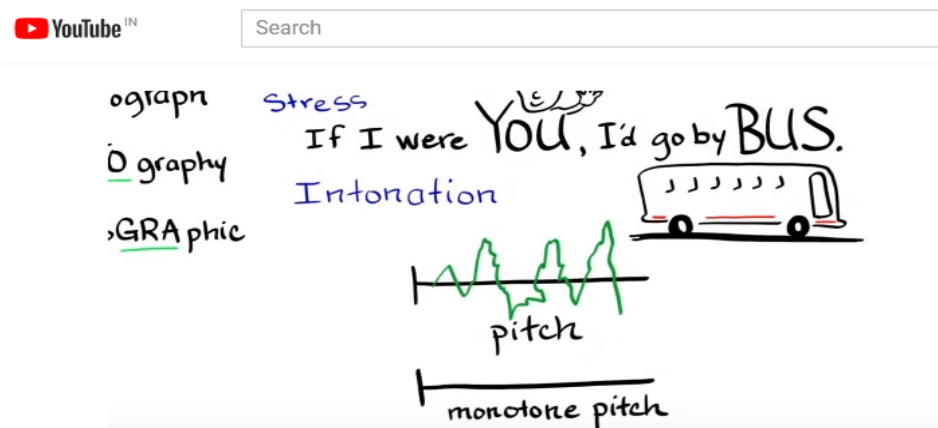


Figure 4. Screenshot of a pronunciation task

Step-6

Although discourse management and interactive communication cannot be taught explicitly, some of the important features of discourse management and interactive communication are explained to both groups. The students were asked to practice the worksheets related to paralinguistic features, discourse markers, structures for speech functions such as asking questions, presenting opinions, narrating, comparing contrasting, and summarising. These tasks were adapted from <https://www.teachingenglish.org.uk/teaching-teens/resources/activities>. After the tasks on discourse management both the groups were given a rubric on discourse management and interactive communication. (Appendix-1). The students were asked to work in pairs or groups. They were encouraged to browse more web-resources related to BEC speaking. Self-directed learning was encouraged.

Step-7

The students of group-A were asked to view the “youtube” video clips of the candidates taking the business English certificate test. (<https://www.youtube.com/watch?v=mAfyJUzqj0I>). After viewing, they were asked some questions on all the three parts of speaking. The students of group-B were asked to view the same video. The link to the YouTube video was posted in Edmodo. After viewing, they were administered an online quiz on the three parts of speaking using Edmodo.

Assessment Criteria

As mentioned earlier, the students of both blended and online groups were assessed on four parameters such as i) grammar and vocabulary, ii) Pronunciation iii) Discourse Management and iv) and interactive communication. The evaluation parameter of each component was five marks. The cumulative score for all four components was rounded to 20 marks and taken for analysis. The rubric is given in Appendix-1. The screenshot of the candidates taking the speaking test at B.S.Abdur Rahman University is given in Figure 5.



Figure 5. Candidates taking the speaking test

<https://drive.google.com/a/bsauniv.ac.in/file/d/0B1OUx2FCjznOQUJHbkQtWDZPOW8/view?usp=sharing>

For validity purposes, the links to the audio recording of the entire test interviews of four samples are provided.

Test sample-1: <https://vocaroo.com/i/s1FkYQwdtRYw>

Test Sample-2: <https://vocaroo.com/i/s1lBsuqpuwxo>

Test sample-3: <https://vocaroo.com/i/s1oYN51UmQze>

Test sample-4: <https://vocaroo.com/i/s0zwcNzphKGW>

Data Analysis

The first part of this section deals with the analysis of the pretest of the blended group and online group. Paired sample statistics and paired sample t-test are analysed. The second part deals with the pretest and posttest of the blended group. The final section deals with the pretest and posttest of the online group. The researchers used 95% confidence intervals to compare the two variables, such as blended and online learning. The difference in mean scores and the standard deviation was used for further analysis of variables such as blended and online learning. The alpha value which is less than 0.5 is reported in three decimal places as.000.

Analysis of Pretest of Blended and Pretest of Online group

Table 1

Paired Samples Statistics

Pair 1	Mean	N	Std. Deviation	Std. Error Mean
Pretest Blended	8.586	29	3.0150	.5599
Pretest-Online	8.638	29	2.5139	.4668

The SPSS output of the paired sample statistics is presented in Table 1. The first column on the left indicates the two variables namely the pretest of the blended learning group and the pretest of the online learning group. The mean of the blended learning group is 8.56 whereas it is 8.63 for the online group. The number of participant in each condition

is 29. Table-1 shows that the mean difference between both groups is minimal. However, the mean difference alone does not provide conclusive evidence. According to Pallant (2010), a paired sample t-test provides conclusive evidence of the statistical difference between the two samples. Cohen, Manion, & Morrison (2013) state that it would be highly appropriate to compare two means using a t-test. Since the samples of the study are independent, a paired sample t-test was used. P-value was calculated to test the significance level. According to Cohen et al., (2013) any value that is less than 5% is considered to be statistically significant. The results of the paired sample t-test are shown in table-2.

Table 2
Paired Samples test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig (2tailed)
				Lower	Upper			
Pair-1 Pretest Blended - Pretest-Online	-.0517	3.8390	.7129	-1.5120	1.4086	-.073	28	.943

We are more interested in the significant two-tailed value that is represented in the final column of the Table. If the significance value is higher than 0.5, we can conclude that the mean difference of the pretest and posttest of the blended group is not statistically significant. The SPSS output of the paired sample t-test provides inferential statistics of the pretest of the blended group and the pretest of the online group. We compared the pretest of both these groups to check if these samples are homogenous. The mean difference between both groups is .0517. The mean indicates that the difference between both the groups is minimal. The 95% confidence interval between the groups is 1.5120 to 1.4086. The t-value is -.073 and the two-tailed value is .943. A P-value of more than 0.5 indicates that the samples are not statistically different. Therefore the pretest performance of blended and the online group is homogenous before the intervention phase.

Analysis of Posttest scores

The research questions raised in the study helped the researchers to explore the effectiveness of blended and online environments. Test scores are indicators to evaluate the learning process. Therefore, the scores awarded under blended and online conditions were compared using a paired sample t-test. The software SPSS version 21 was used to calibrate the data. The analysis provides substantial evidence on the impact of both blended and online instruction.

The Blended Learning Group

A paired t-test was run on a sample of 29 students of the blended learning group to determine whether there was a significant mean difference between the pretest and posttest. The SPSS output of the paired statistics showed the difference between the pretest and posttest. Each participant was assessed before and after the blended learning instruction. The mean and standard deviation of pretest and posttest, standard mean error, degrees of freedom, the t-value, 95% confidence intervals and the significant two-tailed value are reported based on the SPSS output of the paired t-test.

Table 3.
Paired Samples Statistics-Blended Instruction

Pair-1 Blended	Mean	N	Std. Deviation	Std. Error Mean
Pretest	8.586	29	3.0150	.5599
Posttest	10.879	29	2.9211	.5053

The SPSS output of descriptive statistics for the two conditions is represented in table-3. A comparison of the two means shows that the participants have performed better after the blended intervention. N represents the number of candidates in both conditions. The standard deviations indicate that the scores in both pretest and posttest are similarly dispersed. The mean in the paired sample statistics indicates a considerable improvement in the posttest. Although the mean scores show that the participants performed better in the posttest, further evidence is needed to understand if the difference between both conditions is statistically significant.

Table 4.
Paired Differences. Blended Learning Group

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig(2tailed)
				Lower	Upper			
Pretest Post-test	-2.2931	1.3060	.2425	-2.7899	-1.7963	-9.455	28	.000

The paired differences are represented in Table 4. As indicated in the paired t-test the performance of the participants was better in the posttest. A significant t-value was observed. According to the statistical calculations, the two-tailed value should be equal to or less than 0.5 for the effects to be significant. In this case, the 2-tailed value is less than 0.5. Hence we can conclude that the difference between both the tests is real.

Pretest and post-test online

A paired sample t-test was used to compare the performance of candidates in the speaking test before and after online instruction. There was a significant difference in scores between two tests. After the online intervention, the mean has improved from 8.60 to 9.85.

The difference in standard deviation between the pretest and posttest was minimal. Although descriptive statistics show improvement, inferential statistics throws further light on test performance. The paired sample statistics of online instruction is presented in Table 5.

Table 5
Paired sample statistics online instruction

Pair-1 Online	Mean	N	Std. Deviation	Std. Error Mean
Pretest	8.600	29	2.4789	.4526
Posttest	9.850	29	2.5399	.4637

Table 6
Paired Differences-Online Learning Group

	Mean	Std. Devia tion	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig(2tailed)
				Lower	Upper			
Online Pretest & Posttest	-1.2500	.5981	.1092	-1.4733	-1.0267	-11.447	29	.000

The paired difference in the online group between the pretest and posttest are presented in Table 6. The average mean between two variables in the online group is 1.25. The deviation between the variables is .598. The computation of confidence interval states that there is 95% probability that the test will yield similar results. From the two-tailed significance, we can conclude that the difference between both the pretest and posttest is statistically significant at an alpha level of less than 0.5.

Results

The findings are summarised in alignment with the guiding research questions. It is important to note that the research questions were addressed based on the results of a paired sample t-test.

Research question-1

Are there significant differences in the linguistic skills of the blended learning group and online learning group before intervention?

Since the significant two-tailed value is more than 0.5 in the paired t-test, it is clear that there is no significant difference between the samples before the intervention phase. The parity in the scores and an acceptable level of inter-rater reliability indicated the identical nature of the samples thus increasing the test reliability. It is understood that there is no significant difference in the linguistic performance of the blended and online learning groups before intervention.

Research question-2

Are there significant differences in the communicative competence of the blended learning group before and after intervention?

Both descriptive and inferential statistics have shown a distinct improvement in the posttest of the blended learning group. The two-tailed value which is less than 0.5 indicates the significant difference in the mean scores of the blended learning group thus justifying the effectiveness of the blended learning. It shows the students' level of learning in a blended environment. It could also be construed that the instructor's face to face intervention, despite the model shared online, had helped students to learn the nuances of speaking skill, thereby making them perform efficiently in speaking tests. It thus proves the application of Social cognitive theory in the current scenario, in which the instructor had provided relevant models online, tutored and mentored students now and then thereby helping them to build their self-efficacy.

Research question-3

Are there significant differences in the speaking performance of the online learning group before and after instructor's online support?

The two-tailed value which is less than 0.5 indicates the significant difference in the mean scores of the online learning group. The analysis has shown students' capacity to adapt themselves to online learning. With the advent of latest technology in conducting online courses, the outcome of this finding reiterates the possibility of holding full-fledged MOOC Courses for students with credits. It is worthwhile to mention that the Information processing theory is mainly applicable in this context, as the subjects had encoded the information given through Edmodo and performed the BEC Speaking task with confidence.

Research question-4

Which mode is more efficient? Blended or Online learning mode?

The paired sample t-test has shown significant improvement in both the groups. However, the blended learning group has performed better than the online group as indicated in Figure 6. The mean scores have improved from 8.58 to 10.87 in the blended group and 8.6 to 9.85 in the online group. The mean difference is 2.29 for the blended group and 1.25 for the online group which reveals that the blended learning group has performed better than the online group.

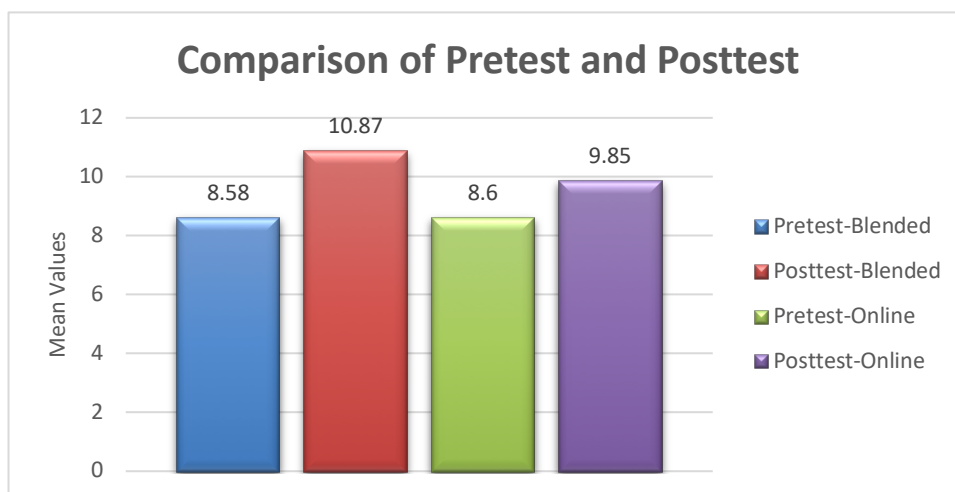


Figure 6. Comparative analysis of blended and online learning groups.

Discussion

The aim of this research project was to determine if blended or online learning would make a worthwhile contribution to the acquisition of speaking skills. In alignment with the objective, the following primary research was formulated. Which mode is useful for facilitation of speaking skills? Blended or Online mode? This study which spanned for six months lead the researchers to conclude that the participants in the blended mode of instruction performed better than the participants in online mode. A pretest-posttest method was employed to understand the effectiveness of the intervention. It is evident from the results of the paired t-test that the mode of delivery significantly impacts the learning process. In this study, the mean difference in blended learning group was statistically significant than the online group. Two essential studies that compared blended and online environments in a language learning context are (Cross et al., 2014) & (Lim, Morris, & Kupritz 2017). The results of this research study substantiate the findings of these two significant studies. Nevertheless, those studies are self-reported and lacks intervention. The findings of this study also confirm the findings of an earlier research study by Lim, & Wang (2016). However, Lim and Wang's study has used a case study method to compare the efficiency of blended and online modes. The results of the study also support the proposition of the earlier study that the hybrid courses facilitate better language learning (Yang, Yin, & Wang, 2018).

The lessons that are delivered through the hybrid learning environment has provided more professional training and has emphasized the role of facilitators. (Chen Hsieh., Wu., & Marek 2016) echo similar findings. They found that individualized instruction provided by the facilitators in a flipped environment lead to effective language learning in an EFL context. Various factors could have led to better test performance in a blended environment. They are i) personalized interaction offered in blended mode would have resulted in better learning outcomes. ii) in the online mode of course delivery it was also not possible for the instructors to provide personal attention. iii) the instructors in the blended mode were aware of the learners' needs whereas this was not possible for online

instructors. iv) the instructors in the blended mode provided individual feedback whereas the instructors in online mode had to rely on LMS for providing feedback.

The study is expected to be of practical significance to both EFL and ESL practitioners who are interested in designing multimedia materials for facilitating speaking skills. It will be relevant to instructors who use either blended or online modes of language teaching. It will help them train their students better. The researchers have aimed to make a significant contribution at the pedagogical level. The framework used in this study for training the students in speaking could be of great help in implementing such courses. At the theoretical level, this study provides more evidence to the information processing theory and socio-cognitive theory.

Despite the statistical evidence, there are certain limitations in the study that needs to be addressed. The efficacy of both modes of instruction was analysed through pretest-posttest score analysis. Replicating this study with a larger sample size using different data collection strategies such as stimulated recall sessions, interviews and survey questionnaires may give a deeper insight into the effectiveness of both these modes. Even though the study has favoured blended learning for preparing students for international speaking exams the results cannot be generalized to second language acquisition (SLA). Therefore, the study merits further investigation in the context of language acquisition.

This study has methodological implications as similar interventions on online and blended learning could be carried out across different domains. A large-scale evaluation in this regard could provide interesting caveats for further research. Incorporating blended learning strategies could lead to promising implications in the second language classrooms. Future researchers could investigate the effectiveness of the blended learning models such as the flipped model, the flex model and station rotation model. A comparative study of these models could be performed and prototype models on blended learning could be developed.

Conclusion

This study aimed to investigate the efficacy of both online and blended instruction for training ESL learners in speaking skills. The three themes of social cognitive theory such as modelling, self-efficacy and tutoring facilitated language learning in blended environments. Similarly, the principles of information processing theory helped the learners to process the information presented to them in online mode and perform efficiently. This study has provided empirical evidence on the usefulness of both blended and online methods. Multimodal input in the form of video tutoring, podcasts and online discussions enhanced the learning process. However, the teachers face to face input along with the multimodal information was far more effective. Understanding students' preference is critical in designing and delivering online and blended programmes. The results of this study were exclusively based on test performance. A mixed methods approach would give a holistic perception of both these modes.

The findings of the study will be of practical use to the institutions in general and language teachers in particular. The findings of this study support the claim made by (Vanslambrouck, Zhu, Lombaerts, Philipson, & Tondeur, 2018). They state that online and blended learning (OBL) is intended to enhance the learning the learning outcomes. According to them a perfect balance between them both these modes is essential to achieve the desired learning goals.

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Appendix A

Rubrics for Assessing Speaking Performance

B1	Grammar & Vocabulary	Discourse Management	Pronunciation	Interactive Communication
5	Shows a good degree of control of simple grammatical forms Uses a range of appropriate vocabulary to give and exchange views on similar topics	Produces extended stretches of language despite some hesitation Contributions are relevant despite some repetition Uses a range of cohesive devices	Is intelligible Intonation is appropriate Sentence and word stress is accurately placed Individual sounds are articulated clearly	Initiates and responds appropriately Maintains and develops the interaction and negotiates with an outcome with very little support.
4	Performance shares features of (Band 3 and 5)			
3	Shows a reasonable degree of control of appropriate grammar forms Uses a range of appropriate vocabulary when talking about appropriate topics	Produces responses which are extended beyond short phrases beyond hesitation Contributions are relevant, but there may be some repetition. Uses basic cohesive devices.	Is mostly intelligible and has some control of phonological features at both utterance and word levels	Initiates and responds appropriately Keeps the interaction going with minimal prompting and support
2	Performance shares features (Band 1 and 3)			

1	Shows sufficient control of simple grammatical forms	Produces responses which are characterised by short phrases and frequent hesitation Repeats information and digresses from the topic	Limited control of phonological features	Maintains simple exchanges despite some difficulty Requires prompting and support
0	Performance below band-1			

Adapted from: <http://www.cambridgeenglish.org/images/168618-assessing-speaking-performance-at-level-b1.pdf>