Chapter - 4

Data Analysis And Interpretation

The present study aimed at analyzing the impact of Internet and Computer-based Tasks on speaking, writing and critical thinking skills of Management students.

Written and spoken data of MBA students was collected administering pre-test and post-test to the experimental group and the control group students after giving web-based instructions and Internet-based tasks to the experimental group. These web-based instructions were administered using the Google Drive tools which facilitated real-time writing and testing environment for the students. The pattern of the pre-test and post-test was similar, the difference being that the level of complexity was increased in the post-test. The post-test was aimed at analyzing and investigating whether there were changes in the performance of the experimental group students after web-based instructions and Internet-based tasks. The data collected was analyzed qualitatively and quantitatively. It was collected to test the following hypothesis which guided the research.

4.1 Hypothesis

1. Internet and Computer-based Tasks are likely to develop writing skills of MBA students.

2. Internet and Computer-based Tasks are likely to develop speaking skills of MBA students.

3. Internet and Computer-based Tasks are likely to develop self-directed learning and motivate them further to develop their communication skills.

4. Internet and Computer-based Tasks are likely to develop Critical Thinking in MBA students.

Null-hypothesis:

No significant changes are seen in writing and speaking skills and critical thinking of MBA students when they are taught with the help of Internet and Computer-based Tasks.

The following section presents key findings in the areas of writing, speaking, self-learning & motivation and critical thinking.

4.2 Writing

Hypothesis 1. Internet and Computer-based Tasks are likely to develop writing skills of MBA students.

The first hypothesis tested was whether MBA students develop writing skills when they are offered instruction in the form of Internet and Computer-based Tasks. The data collected by administering a pre-test and post-test was analyzed for writing style, persuasiveness, analytical ability, vocabulary and mechanics. These skills are very important for an MBA student to survive in the industry and corporate environment. The studies of Ybarra & Green (2003) revealed that web-based instructions for writing courses work as important factors in enhancing the quality of writing among students of various levels. Web-based lessons, when added as a supplement to traditional in-class writing instructions, bring more effect than teaching with textbook alone (Al-Jarf, 2004).

4.2.1 Qualitative Analysis

For qualitative analysis all pre-test and post-test data of the experimental and control group was evaluated by three examiners as detailed in the previous chapter. For the purpose of analysis, the average of the scores marked by the three examiners was taken into consideration to find out whether the students had improved on their writing skills after research intervention.

4.2.1.1 Experimental Group

The analysis of the data revealed some significant findings. The comparative analysis of the pre-test and post-test data revealed:

A. Positive impact on various aspects of writing

B. Variation in the writing pattern

C. Increase in number of students using persuasiveness in writing.

Each of the above is discussed in detail in the next sections.

A. Positive Impact on Various Aspects of Writing

The positive impact that was observed in the experimental group was that it helped them to score better than the control group. This improvement is corroborated by Ucar & Yükselir (2015) in a study which covered EFL students wherein the students were offered web-based inputs to enhance their writing skill.

The **increase in the range of scores for the experimental group** (EG) was from 8 marks to 1 mark. Out of a total of 50 students, 80% (40 students) had increased scores that ranged from 8 to 1 mark, 18% (9 students) students' test scores decreased and one student (2%) got the same marks as in the pre-test. But the most significant finding was that all the students under experimental group improved their scores in the writing component as against the students of control group in which only 46.80% (22 students) showed improvement in the post-test scores. Their increase in range of marks was by 1-2 marks.

The change in scores resulted because the students showed:

a) Development in analytical skills

b) Reduced anxiety in writing

c) Development in structures and vocabulary

d) Learner autonomy due to group work

Each of the above observations is discussed in detail.

a). Development in Analytical Skills

Analytical ability is an important quality, which all employers look for in their employees. Internet-based tasks included several charts and graphs which the students analyzed and presented in a well-written manner. They were also provided with original professionally written research reports for understanding how analysis has to be done and how to write analytically.

In the post-test, the experimental group students performed better in the writing skill in post-test. The following excerpt is an example from the analytical description of an infographic from one of the student's pre-test and post-test writing that shows the change that occurred in his writing pattern at the time of post-test.

(All examples from Pre-test and post-test scripts are reproduced as written by the students, without editing)

Pre-test script

> *In this picture comparison between 2011 and 2012 how much peoples use mobile application and what is the download rating of application. Oval store in India it was 3rd fastest growing application market in the world.More and more peoples use android cell phones. 6 million android and iOS devise downloaded 300 million application in 2011. The growth of MoM apps downloads in 2011 is 12%. Indian people spend 52 minutes per day using mobile apps in India compare to other country. Only 5-10% people use apps after 6*

The above answer has errors related to mechanics, vocabulary and there is a lack of analytical perspective. However, the same student described another infographic in the post-test that reflected better analytical ability. This was because the student received instructions

through internet tools and web based materials which helped to analyze the data in an organized way. The answer of the post-test is presented below:

Post-test script

Mobile devise is the new market trifecta in the USA. 70 million people use smart phones in the USA and 285 mobile devises in USA. 97% of USA households use emails. 66% of marketers are integrating social media with their email marketing campaigns. "Is optimizing the mobile marketing experience important?" 31.6% people say yes, 29% not sure and 24.6 % still testing. 23% of companies offer mobile version of websites. 91% marketers use Facebook for marketing, 83.3% use twitter, 48% use linked in, 34% people use youtube.

Comprehensive tasks with real-world infographics and other online contents helped the students perform better in the post-test. The experimental group students showed a positive shift in overall performance as their scripts reflected their analytical ability. They were able to write answers in an organized manner after instruction.

The following is one more example of how a student has improved from pre-test to post-test in analytical ability.

Pre-test script

the TCS company the end of 2013 balance sheet to show more about the company profit maximisation.tcs also year of growth incrased per year. in the every year make profit that meaning is that the company making profit every year. the balance sheet shows the company growth maimisation.

The above pre-test excerpt shows that the student is not able to analyze and present the data with clarity. Also, there are spelling mistakes and the punctuation marks not used in proper manner.

The following post-test script was written by the same student that shows a positive change in the analytical ability of the student.

Post-test script

The Accenture sheet features a comparison of the revenues between third Quarter(3 months ended May 31,2013 and May 31,2012) and year to date (9 months ended May 31,2013 and May 31,2012). In 'operating group' the revenue of third quarter is INR 7,198,140 and that of the year to date is INR 21,476,143. In 'geography group' the revenue of third quarter is INR 7,198,140 and that of the year to date is INR 21,476,143. In type of work the revenue of third quarter is INR 7,198,140 and that of the year to date is 21,476,143. The revenue in third quarter is less as compared to that of year to date.

Though structures are repeated in sentences, they reflect the details in an easy to understand pattern. When the explanation was compared with the analytical reports prepared by professionals, there were some similarities in the manner in which data was presented. This showed the positive effect created by reading of the articles.

b). Reduced Anxiety in Writing

Any process of learning sees anxiety as one of the factors among students. According to Zhang (2001) and Hilleson (1996) when students perform activities that require productive skills, they experience considerable amount of anxiety. Since writing is a productive skill, it demands students' proper attention resulting into learning anxiety. Writing anxiety is also observed because of language complexity (Bruning & Horn, 2000). In this research, the writing excerpts of experimental group students showed that they were more comfortable with the writing process in post-test as compared to pre-test.

Another reason for their increased scores in the writing component can also be attributed to the fact that as the experimental group students' were offered continuous

feedback on their tasks, their writing anxiety decreased. This **corroborates** Kasper and Petrello's (1998) views that **feedback from teachers helps ESL students to feel motivated and also decreases their writing anxiety**. Apart from the feedback provided, the materials that were presented to the students in the form of tasks had contextual information which supported successful learning with a specific academic domain like writing (Vygotsky, 1987).

c). Developing Structures and Vocabulary

The research intervention was equally supplemented with reading of articles. This enabled them **to understand the kind of structures and vocabulary they should use while writing. The videos also provided them with real-life techniques to apply in the writing process**. The **individual and group exercises** which were comprehensive in nature helped them perform better in the post-test.

The following example shows improvement in vocabulary and writing mechanics of a student under Experimental group.

Pre-test script

> *when i am in 12 the standard i got 78% and i get in admission in business administratin in rajkot.theni give cmat exam and i get 849rank in all gujrat then i get admission in changa at iiim and after the admission i will become sophesticated manager. i would like to study in this college. 1-sophesticated manager 2-good in c.s skills 3-good in finance mgmt*

In the above excerpt, errors related to grammar and spellings are in plenty. The student has the clarity of what he wishes to state about himself but lacks the ability to convey it in writing. However, the post-test answer shows that this time the student was able to write his thoughts in a way that could be easily understood by the reader. Another interesting point to note was the length of the answer almost doubled in the post-test which showed his increased level of comfort in writing using the computers.

Post-test script

I want to specialize in Human Resource Management. As I have a keen interest in studying HR I will choose it as specialization. I will try my best to achieve higher level position. Through the following ways. I will acquire some skills and personal qualifications that will help me to work successfully in Human Resources include.

- Effective interpersonal skills so I can interact successfully.

- Knowledge of computers and information systems.

- Effective spoken and written communication.

- Comfort with diverse people who have various educational levels, cultural heritages, religious practices, ages, work experience, and opinions.

- Understanding of statistics and finance.

- Conflict resolution skills.

- Able to set and accomplish goals and work as a member of a team.

- Demonstrate a high level of integrity, confidentiality, and fairness.

As it can be observed from the above answer, use of computers and Internet-based tasks helped them in improving their writing performance. This is in line with Ghandoura's (2012) study when he found that students could acquire writing skills easier and faster because computers immediately alerted them on their grammatical and spelling errors, which helped them to change their structures.

Another example is presented that reflected lack of use of punctuation and grammar in the pre-test but later in the post-test answer, one can observe a difference.

Pre-test script

When i was in 12th standard i determine i want to become a good manager in business line and good communicator. first i had to decide work hard in english. i was planed to improve my communication skill,vocabulary, and all the obstacles which are hampering me to communicate with other. when was in my 12th stdi think that in future communication skill and computer skill is required.. After MBA i want to become a good communicator and good manager.My aim is good manager with good communication skill.i want to good command in communication skill.i want to good command in english.

The above answer lacks proper use of grammar and punctuation. However the same student's post-test **answer reflects better punctuation and use of grammatical structures** as compared to the pre-test.

Post-test script

I plan to specialize in finance. Because its for me its very easy to understand and i like it.I have had an interest in finance since graduation. It was one of my favourite subjects, hence my choice to continue further studies in this field. Finance are good branches by job perspectives available in the market. Finance is very important field in the organization and it is useful for future also. There are so many scope available in market so that's why first I preferred finance as a specialization in MBA.

In the present study, 36% students of experimental groups showed improvement in their vocabulary scores as against 25% students of control group. These results corroborate with the findings of Ybarra & Green (2003) who state that the use of technology enables the students to improve their vocabulary usage. The students under experimental group were

made to work in groups on different writing tasks which fostered interpersonal communication among them resulting into improved vocabulary usage.

d). Learner Autonomy due to Group Work

Pair work and group work helped students to develop confidence while writing. The studies of Storch (2007) suggest that **pair-work allows students to combine their linguistic resources in order to collaboratively create new knowledge about language**. This can help them in building more successful writing experiences. In this research, the students were made to work in pairs so that they could brainstorm and collectively do the tasks. The data also reveals that pair work helped students in creating a corpus of vocabulary needed to create better-written texts, relying less on the instructor. This corroborates Gagne and Parks (2013) who found that using the small group method was a successful strategy to produce the language needed to complete a writing task. The group work led the students to gain **more confidence while writing, leading to learner autonomy**.

The following is an example of how writing underwent a change when students worked in groups. This pre-test excerpt deals with a case study. It lacks proper organization and structure which a student is expected to possess.

Pre-test script

> *There is upward and downwrd communication. Being on time, punctual is good, but that does not mean to hurt ourself. Reaching before the time watching everything on the way, on the floor instead of hurrying up so much which affects later. if we are late no problem because nothing is more important than our body which supports.*

This student and others were made to work in pairs during the academic sessions. They interacted with each other while writing and completed their tasks. The result shows a

marked improvement in their writing style. The following excerpt shows the improvement in writing when done in pair-work.

Post-test script

In this case due to the ineffective communication the problem occurred. The company was communicating through emails. It was a very effective tool for communication. But company fails to communicate with its employees. Even the management staff fails to communicate effectively. Because of lack of communication such situation arises. So company has to more concentrate over their communication pattern.

The above example reveals that the student developed more clarity and was able to put the information in an organized manner as compared to the pre-test answer.

B. Variation in Writing Pattern

The data also revealed interesting writing patterns of the experimental group students. The following table shows that there was an increase in the number of students whose marks increased in writing style, analysis, persuasiveness, vocabulary and mechanics in experimental group students as against that of control group students. The table shows the comparative data of writing patterns.

Skill	Experimental Group		Control Group	
	No. of Students	Percentage	No. of Students	Percentage
Writing Style	35/50	70%	23/47	49.93%
Analysis	38/50	76%	24/47	51.06%
Persuasiveness	35/50	70%	23/47	48.93%
Vocabulary	18/50	36%	12/47	25.53%
Mechanics	15/50	30%	10/47	21.27%

Table 4.1 *Variation in writing patterns*

From the above table it can be observed that in nearly all components more number of students from experimental group scored more marks than the control group. In writing, 70% students under experimental group showed improvement as compared to 49.93% students of the control group. Most importantly, in analysis and persuasiveness components 76% and 70% experimental group students performed better as against 51% and 49% students of control group, respectively. As mentioned earlier, in vocabulary, 36% students of experimental group showed improvement as against 25% control group students.

Internet-based tasks prove to be more effective in teaching writing as compared to only textbook-based teaching (Al-Jarf, 2004). The result of this study corroborates the works of Al-Jarf and Breese. Breese (1996) who observed that unlimited access to word processors helped students in improving their writing over a period of time. In the present study the experimental group students were made to use Internet and complete their tasks during the research intervention and the result was seen in the form of an improvement in their post-test scores. The exhaustive exercises the experimental group students undertook during the research intervention helped them improve their writing.

Lastly, in writing mechanics, 30% students of experimental group showed improvement as compared to 21% students of control group. Writing effectively with minimum grammatical errors and using effective vocabulary is hallmark of good MBA students. This reveals that they wanted to create a positive influence about themselves and therefore tried to make minimum errors. The reason being, the students were given tasks which involved watching video recorded by native speakers. It resulted in improvement of grammatical structures in the writings of experimental group students. Tavales and Skevoulis (2006) also opine that listening to native English speakers plays an important role in improving students' grammar.

C. Increase in Number of Students Using Persuasiveness in Writing

Persuasiveness is an important element of writing as one would like to convince the reader about what he is trying to convey. Twenty first century managers require this skill if they are leading teams and want to convince their team members in undertaking some projects. Table 4.1 also shows that the experimental group used the persuasiveness strategy in an effective manner which comes to the fore as a result of having confidence in writing. Studies by Claggett & Goodhue (2011) and Cázares (2010) have established a connection between ICT learning environments with increased confidence level. Corroborating their findings, in the post-test 70% experimental group students were able to write in persuasive manner as against 48% students of control group. This improvement in the experimental group students is also due to the motivation and confidence they received with the technological inputs in the form of Internet and Computer Based Tasks.

The Internet and Computer-based writing tasks were planned with the integration of the real-world data and students were given the assignments of analyzing and interpreting those data and writing in a way so that the reader can understand the information with all the relevant details. The infographics combined with the tasks, presented a unique challenge to students to interpret and explain the complex information woven into them.

Apart from these tasks, the activities such as book review, website review, retrieval of information from the audio and videos, and writing in a manner that is clearly understood, helped them to gain a deeper insight into analytical writing.

The case studies which were shared with the students during the research intervention helped them to critically analyze the situation and explain to the readers in a persuasive style.

Decreased Scores

There were 9 students (18%) in the EG whose overall scores decreased in the post-test. The scores of all decreased in the writing component. A point to note is that though their

scores in writing went down, the marks of the five (5) students improved in the analysis and persuasiveness section. However, all of them lost marks in vocabulary and mechanics.

The reason could be that the students were more concerned in improving their analytical and persuasive skills in writing as it is a hall-mark of management students. It should be noted that the tasks which students had undertaken in the instruction provided elements of critical thinking and were built on the basis of higher order thinking skills as propounded by Anderson and Krathwohl (2000). Therefore undertaking these tasks helped them to develop their analytical and persuasive skills.

It is likely that they also did not pay attention to the language component because we all know that today writing on a computer is easier for students as errors get auto corrected as the earlier example in this section has showed. But the tasks which students had undertaken in the instruction provided elements of critical thinking based of Higher Order Thinking Skills of Anderson and Krathwohl (2000).

4.2.1.2 Control Group

An analysis of the post-test scores of the control group revealed that in comparison to the experimental group, total scores of some students increased by only 1 or 2 marks as against 7-8 marks in the experimental group. In the present research, out of a total of 47 students, 47% (22 students) had increased scores that ranged from 1-2 marks, 27% students (13 students) did not show any change, while 25% students' (12 students) marks decreased. Some students did show improvement in their scores, but it was minor as compared to those of the experimental group students.

Though the control group was not given any formal training like the experimental group, there were some students who were able to improve their scores in the post-test. These were the students who had done well even in the pre-test as well. The slight improvement in their scores indicated that if they were also offered instruction through Internet-based tasks,

they would have also improved and achieved better results as students of the experimental group. This proves that research intervention really helped the experimental group students to develop their writing skills.

In the control group, the total scores of 22 students (46.80%) increased by 1-2 marks. Some students lost in the writing component but gained marks in the analytical and persuasive components. Marks in vocabulary and mechanics also decreased for 5 students. This means that even though they were not instructed through Internet-based tasks they **had the will to improve and develop in them the qualities required to get employment. This goes to prove that had they been instructed they would have fared better than they did presently**. The following excerpt from an answer from the control group shows slight change in the writing pattern but more improvement in the persuasive and analytical skills.

Pre-test script

> *In the financial year 2012 the total revenue was little low comparing to 2013. The TCS company spent more in the 2013 in comparision to 2012. The before tax was higher in 2013 than 2012. The company spend more tax in comparision to the last year. The profit before interest was also higher than previous year. The net profit for the period was also higher in compare to last year. The Earning Per Share was also higher than last year. So the whole Profit & Loss A/c indicates that company making higher profit at the end of quarter for 2013 than at the end of higher in compare to last year. The Earning Per Share was also higher than last year. So the whole Profit & Loss A/c indicates that company making higher profit at the end of quarter for 2013 than at the end of 2012.*

The above pre-test answer lacks the use of analytical expressions and also has grammatical errors. However, the post-test answer reveals an improvement in the analysis of

the data which was shared in the question. Also the produced text had persuasive characteristics.

The post-test excerpt produced below is more specific as compared to the pre-test answer.

Post-test script

Accenture is a global management consulting, technology services and outsourcing company. Revenue reported by it was US$27.9 billion for fiscal 2012. Operating Groups and Industry GroupsincludesCommunications, Media & Technology,Financial Services, Health & Public Service, Products, Resources .Income generated by geography and type of work is 7,198,140 and 21,476,143 of georaphy and same as type of work and operating and industry group. So all industry and group have same fiscal net revenue.

This could be the result of other subjects the student learnt during the formal course of studies in the MBA. However, the last sentence confuses the reader. There is no connection between the paragraph and the last sentence. Also the grammatical errors were not looked into. Because of the Internet-based tasks implementation, instances mentioned above were rare in the writings of experimental group students whose scores increased. It justifies that **due to the implementation of the Internet-based tasks in the experimental group, the level of improvement in the post-test was higher in terms of writing than in the control group**.

No change in scores

The total scores of thirteen students in the pre-test and post-test remained the same. Though their total scores remained same, it was observed that majority of students had lost marks in writing, vocabulary and mechanics. In case of some students there was a slight improvement due to which their overall scores remained constant.

Decreased scores

Marks of 12 students decreased by 1-2 marks. A significant point observed was that nearly all students had decreased scores in writing, analysis, persuasion, and mechanics. Those students whose total marks did not increase; their scores in other writing components remained constant. This meant there was virtually no improvement in the post-test. The writing pattern of the students under Control Group remained almost unchanged. This goes to prove that in the **absence of instruction through Internet and Computer Based Tasks the students of the Control Group did not improve on their writing skill** to be called proficient MBA students.

4.2.2 Quantitative Analysis of Writing

To corroborate the qualitative analysis of students' pre-test and post-test scores, quantitative analysis of the results was also carried out. The collected data was computed for descriptive statistical analysis.

Descriptive statistics helps in summarizing the findings by describing general tendencies of data and the overall spread of scores (Dörnyei, 2007). According to Seliger and Shohamy (1989), descriptive statistics are a set of procedures that help researchers describing different aspects of the data. It helps researchers in gaining an insight into the data, that is, how varied are the scores and what could be the reason for the variation. This means, that it paves the way for inferential statistical analysis. It can be used for subsequent analysis phase of a specific research. The two major categories of descriptive statistics are the 'measures of central tendencies' and the 'measures of variability'.

The 'measures of central tendencies' includes the mean, median and the mode which provide information about the average and typical behaviour of subjects with respect to a specific phenomenon in the research. In this category, the mean is the average of the scores,

which is used most frequently because of its stability in repeated sampling and its use in advance statistical procedures (Seliger and Shohamy, 1989).

The ‘measures of variability’ includes the range, variance and standard deviation. It provides information on the spread of specific phenomena among the subjects in the given research. The most common variability measure is standard deviation (SD) which indicates the average distance of scores from the mean. SD is high if the sample is heterogeneous and contains extreme scores, and it is low in a homogeneous sample with the scores clustered around the mean.

Thus, for the present study, the data collected from the pre-test and post-test of experimental and control groups, was analyzed statistically. The following table shows the comparative mean and std. deviation of the test scores of both the groups.

	Mean	N	Std. Deviation	Std. Error Mean
Experimental Group Pre-Test	11.50	50	3.202	.453
Control Group Pre-Test	11.13	47	2.102	.307
Experimental Group Post-Test	15.12	50	3.962	.560
Control Group Post-Test	12.62	47	1.824	.266

Table 4.2 *Paired sample statistics for experimental group test scores*

The results revealed that the overall mean of the pre-test in experimental group was 11.50 and the standard deviation was 3.20. In control group pre-test overall mean was 11.13 and the standard deviation was 2.10. The overall mean of the experimental group post-test was 15.12 and the standard deviation was 3.96. Whereas, the overall mean and standard deviation in control group post-test were 12.62 and 1.82 respectively. The SD was the result of heterogeneity of sample.

T-Test Analysis

Further analysis of pre-test and post-test scores was done using a T-test. The T-test is used to compare the means of two groups. T-test helps researchers in determining that the differences found between the two groups i.e. experimental and control group, are results of the research intervention and note due to chance (Seliger and Shohamy, 1989). In the present study, the T-test was used to compare the means of pre-test and post-test of experimental and control groups.

Details obtained from the T-test analysis of the pre-test and post-test in Writing of both the groups are shown in Table 4.3.

	Paired Differences					**T**	**df**	**Sig. (2-tailed)**
	Mean	**Std. Deviation**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
				Lower	Upper			
Experimental Group Pre-test Experimental Group Post-test	3.620	2.127	.301	3.015	4.225	12.032	49	.000
Control Group Pre-test Control Group Post-test	1.489	1.755	.256	.974	2.005	5.817	46	.000

Table 4.3 *Paired samples T-test for overall scores*

The T-value obtained from the analysis of the overall mean scores of the experimental group pre-test and post-test was 12.032 as against 5.817 of control group. The details of paired T-test analysis for the pre-test and post-test of experimental and groups showed that the P-value or value of significance was 0.000, at the level of 0.05.

The analysis shows that there was a significant difference between the overall mean scores of the pre-test and post-test in both the groups. The mean score of experimental group was 3.620 as against control group's mean score of 1.489. The difference in mean score suggests that there was high level of improvement found in the writing of experimental group as compared to control group students. The higher improvement was not due to chance but due to the research intervention, that is, the Internet and Computer-based Tasks which were offered to the experimental group students. The result the quantitative analysis of writing data thus corroborates with the findings of the qualitative analysis.

4.2.3 Significant Findings

Analyzing and interpreting all data on writing, the significant findings of offering Internet and Computer Based Writing Tasks to the MBA students revealed that it:

a) created positive impact on students' writing style

b) helped them in developing analytical ability

c) helped them in developing a persuasive writing ability

d) motivated them to write more due to which their writing anxiety decreased

e) helped them in developing their vocabulary and so language

f) helped them to develop interpersonal skills

g) helped them to write in a professional manner.

The qualitative and quantitative analysis of the pre-test and post-test scores of experimental and control group corroborated the fact that there was a significant improvement in writing of experimental group students over the control group. The hypothesis that **Internet and Computer-based Tasks are likely to develop writing skills of MBA students** is thus proved **positive.**

4.3 Speaking

Hypothesis 2. Internet and Computer-based Tasks are likely to develop speaking skills of MBA students.

The students under experimental and control groups were given pre-test and post-tests in speaking. The recordings of their answers were transcribed and three examiners evaluated the pre-test and post-test recording scripts of both the groups. For speaking analysis rubrics were adopted and adapted from BULATS and CEFR proficiency indicators which have been discussed in detail in the previous chapter. Qualitative and quantitative analysis of the combined scores is presented here.

4.3.1 Qualitative Analysis

In speaking, students under experimental and control groups showed variation in their performance in post-tests. The comparative analysis of the pre-test and post-test data revealed increase and decrease in the range of scores.

4.3.1.1 Experimental Group

The increase in the range of scores for the experimental group in speaking skills ranged from 23 marks to 1 mark, and the decrease in marks ranged from 8 marks to 1 mark.

Out of a total of 50 students, 37 students (74%) had increased scores that ranged from 23 marks to 1 mark while 13 students' (26%) test scores decreased. The significant finding was that all students under experimental group improved their scores in the speaking component as against the students of control group in which only 14.90% (7 students) showed improvement in the post-test scores.

In this group 19 students' (38%) scores increased by 10-23 marks in speaking post-test. Most of them achieved their tasks in post-test by giving appropriate responses, using a wide range of vocabulary. Their pronunciation was easy to understand with prompt responses and natural hesitation.

The following are the changes experimental group students showed as a result of the tasks offered to them.

A. Better analysis

B. Enhanced creativity

C. Focus of content

D. Increased confidence level

E. Better control over their speech

Each of the above observations is discussed in detail.

A. Better Analysis

The students of MBA are expected to be effective at analysts. Analytical skill is a prerequisite for managing meetings, discussions and presentation. It is observed that Internet-based tasks helped them in improving their analytical ability. They were given the tasks of interpreting information from YouTube videos, recording themselves in conversation with peers and audio-reviewing different books and websites. These tasks provided them exposure to business English and enabled them to produce language with an analytical approach. Apart from this several TED videos incorporated into the tasks helped the students in managing their speech and time while recording themselves. These results corroborated the studies of Ybarra & Green (2003) that integration of Internet-based tasks help students in achieving better results, and computer simulations improve speaking skill among adults Ranalli (2008) and Freiermuth (2002).

The students under experimental group were made to record their speeches and conversations. The following pre-test and post-test transcripts show how the students in the experimental group improved their speaking skill with the help of Internet-based speaking tasks.

Pre-test script

{BR}…um, as we can see that there is a one diagram umm which shown, um {BR} there are seven bars and they tell us regarding the US digi- ad spending. This graph uh describes that how companies spend money on digital advertise- um and {BR} there is a data about (( )), um, it in year two-thousand-ten and two-thousand-eleven and two-thousand-twelve and two-thousand-thirteen and two-thousand-fourteen and two-thousand-fifteen and two-thousand-sixteen. {BR} um, you can see that in two-thousand-ten the comp- spends, um, twelve point zero percentage money on digital ad spending. This diagram also descra- describe the {BR} $ (dollar) that the company (( )) spend in above mentioned years on digital ad spending {BR}

The above transcript reflects several fillers and language related errors. The student fails to speak words like 'describe' at the first attempt. Heavy breathing in the recording shows that he is not comfortable but tense. The student addressed the 'graph' which has been used in the question as 'diagram'. Also lack of analytical ability is observed, as the student could not explain the data contained in the graphical form.

In the post-test, the same student's transcript of the audio answer (given below) shows a remarkable improvement. One can observe the increase in his comfort level in speaking and improved language usage. The punctuation marks suggest that there were proper pauses between sentences so that the listener can understand what he is trying to convey. The student has hardly used any filler in the answer. More importantly, at the time of post-test, the student has demonstrated an analytical pattern to describe the data which is reflected from the graphs used in the question.

Post-test script

Here, three graphs are given. Um first one describes select methods used by US Internet users to access banking information in the month – March two-thousand and thirteen. It is in percentage of respondents. According to this graph, seventy-five percentage people accessed banking information from a computer i.e. desktop or a laptop, sixty-five percentage used an ATM. {BR} thirty-four percentage of them used smartphone, twenty-six percentage called banks number and twenty-three percentage users used smartphones web browser to access the banking information. {BR} The second graph is also about the similar data but for the year two-thousand-twelve. Something new that this graph features is the data about bank customers making mobile payment. It shows that fifteen percent of them made a mobile payment. This data is not available in the two-thousand-thirteen graph.

Here is another post-test script which was an answer to question No. 3.

Post-test script

This report is about a new era which is going to start in the smartphone segment. The 5.4 billion acquisition of Nokia by Microsoft may bring different kind of smartphone technology. As the report tells, an era in mobile phones ends with this step and another is starting.

In this concise script, there are not many details that feature from the original report, but there is an analytical approach by the student that is revealed.

This shows that continuous exposure to ICT-integrated environment enabled the student to be more comfortable with technology to enhance his speaking skill. Apart from gaining better control over the language usage, the student also became better at analyzing and presenting information in oral manner.

B. Enhanced Creativity

The experimental group students were assigned tasks like adopting a role of radio jockey or to interview a persona and record it. They were also made to watch different conversational situations in groups so that they can acquire the traits of an effective and prompt speaker which leads one to become a better orator and helps in passing on right instructions in a team.

The following pre-test script is an answer to one of the pre-test questions. One can observe some words which could not be recognized in the recording. Also the script reflects tension in the student's tone. Apart from that, the most important thing to notice about this answer is its inappropriateness. The students were asked to assume the role of a radio jockey and record a speech on some creative aspect, instead in the present answer the student has talked about his personal achievements. This could be the result of ignorance or perhaps the student was not able to decide how to answer the question appropriately.

Pre-test script

> *I am a radio jockey. {BR} Actually um I want to share something about my own business, my own experience. {BR} I was started my business before ten moths um of um food shop at Surat and um the and um also my best friend is my partner so um our business is on successful (( )) path in very soon. {BR} We have a creative idea about our business, {BR} how to expand our business, how to successful our business. In three months we fund our business and we open second branch of food shop. Um our promotion strategy is very unique from others. Competitors very fear from our business. {BR} Many of them are close down their business. So this is about my business.*

However, at the time of post-test, the student dealt a similar question in appropriate manner. Though there was repetition in the audio, the **content** looks more **organized.** As compared to the pre-test answer, the post-test answer is more **specific**.

Post-test script

{BR}After ten years from now I would like to see myself as a human resources manager at um one of the reputed companies. I plan to specialize in {BR} Human Reso- um HR to achieve this goal. I also read a lot of books to see that I gather the knowledge which would be required to reach to the platform I am dreaming about, I mean HR. {BR} Apart from this I read the case studies on HBR and other management websites. Um and the library also helps me a lot to enrich myself with current and latest information. Thank you. (Post-test Q5)

The appropriateness of content organization and presentation observed in the above answer indicates that undertaking the Internet-based tasks, the students developed creativity and clarity in communication.

C. Focus on Content

The ICT environment provides students room to practice and enhance their speaking skills (Dickinson et al., 2008). Such an environment was created for the experimental group students to allow them perform different speaking tasks and improve speaking.

The following pre-test transcript shows the use of informal language. In this recording also several words are not audible. At times the student is not able to control the anxiety level, which is seen from the heavy breathing at several points and also, language needs improvement. The fillers show that the student is not able to maintain continuity in speech.

Pre-test script

Email one of the (( )) marketing tacti- (( )) Emarketing style have access to all the activities and (( )) {BR}. You can learn more about email marketing below but you can learn a lot. Email marketing sub- subscription. Um start a working with E-marketing. May two-thousand-twelve data show signi- significant marketing worldwide Email marketing very important. Six point six percentage marketers use email marketing for (( )). Conversion rate is um uh one point five percentage. This graph about two-thousand-ten two-thousand-twelve and house list and prospect list {BR}. Uh improvement in email open rates is (( )). Click-through rates for both in house and in prospect is (( )). (Pre-test Q3)

In the post-test script, on the other hand, in the beginning the same student sounds informal with the use of 'Hi', but the later part is conveyed with a proper level of formality. The vocabulary usage has improved; he has also used numerical data at the right places, reflecting a formal tone.

Post-test script

Hi. This report is about Microsoft' acquisition of Nokia's devices and services unit. Microsoft has taken over it for five point four billion Euro. Um the report reflects that Microsoft has purchased both Lumia and Asha brands from Nokia. Nokia sold fifty-four million devices in second quarter of two-thousand-thirteen. According to the report, Nokia will continue to develop its products but that will be done under Microsoft now. With this Microsoft is planning {BR} to sell Windows operating softwares pre-installed with the new smartphones. It also describes that once Nokia was dominating forty percent market share in mobiles and now it will be a part of Microsoft. {BR} The report ends with a lesson for

other companies telling that companies like Nokia and BlackBerry failed to understand the shift to touchscreen devices and tablets and so could not survive.

In a research study carried out by Swain and Lapkin (1995), they found that podcasts helped English learners in improving their speaking. In this research students were also made to create podcasts so that they could listen to their scripts and make the required changes in the later versions. It was observed that podcast creation tasks helped the students in gaining better command over pronunciation and maintaining clarity in their speeches. Also, the reduction of pauses and clear utterances show that the students were more comfortable recording themselves at the time of post-test. The tasks also helped them to be more confident while speaking.

D. Increased Confidence Level

Most of the pre-test transcripts presented in this chapter reflect students' uneasiness at the time of answering questions orally. Since they face several barriers, psychological, physiological, physical, systematic and attitudinal at the time of speaking, they are not able to justify such tasks. Lack of self-confidence as a result of psychological and attitudinal barriers makes it difficult for the students to speak in foreign language and even in mother tongue. According to McIntyre (2004), self-confidence helps students to communicate effectively in a foreign language. Self-confidence is one of the keys that enable the students to be more comfortable while speaking and prevents them from being shy.

In the present study 90% of the students in experimental group stated that they became more confident while speaking. Equal number of students also said that 'now they were more comfortable while delivering presentations'.

The following observations reflect that students from experimental group felt more confident after the treatment, as

a) the length of their oral answers increased by 30%,

b) they sounded clearer while answering the questions at the time of post-test,

c) their style of presentation improved and they were able to explain the statistical information in a better manner,

d) they were able to maintain pace in their expressions which shows that their level of comfort increased at the time of post-test,

e) their breathing pattern sounded more relaxed at the time of post-test compared to the control group students.

E. Better Control over Their Speech

As mentioned earlier, there were several gaps in the recording of a student's pre-test but that frequency decreased in the post-test. In the following example improvement is observed in the use of vocabulary and clarity in the answer.

Pre-test script

Hello, good morning, recently I read the book is 'Habit of Good Result'. We have to learn how to achieve good result, we have to make um a habit of getting um good result. So um this book which helps us for making a good habit on getting a good result. We will perform a good so that result will also be a good so that by performing a well we will a good result. And we will become habituated getting a good result.

Post-test script

I recently visited the website called {BR} www.about.com. The website is made of different informative portals. This site offers expert tips in areas like accounts, finance, human resources, communication, language (( )) improvement etc. One of the best features of this site is its email newsletter facility. You can sun- subscribe to the email newsletters of www.about.com and you will um receive a daily lesson in the area of your interest.

From the above two answers, it is understood that there is a clear improvement in the language use of the student. As he/she talks about a website, the use of specific term ‘portal’ makes the script more formal and not general.

Decreased Scores

Despite research intervention, in the experimental group, marks of 13 students (26%) decreased by 1-8 marks. In the post-test, virtually no improvement was noticed. A feeling of anxiety was observed in their voice. It means they were not able to achieve the comfort level their peers could achieve.

Students in this group were able to achieve very few of the simplest parts of the tasks in a very limited way. Most of their responses were inappropriate, ambiguous or not attempted. Their utterances were limited to single words. The range of language was limited and inadequate to complete the tasks. Also the pronunciation of several words was improper and excessive hesitation was noticed while they were speaking.

4.3.1.2 Control Group

As compared to experimental group students, very minor improvement was observed in control group students, because Internet and computer-based speaking treatment was not given to these students.

There were only 7 students (14.90%) who showed improvement in their speaking marks during the post-test. Their marks increased in the range of 1-11 marks. Though their scores increased slightly, there was no significant change in their performance as compared to experimental group students.

Some of their responses were inappropriate and ambiguous; and sometimes not attempted. They were able to express simple ideas with some incoherence. They projected limited range of grammar and vocabulary as was evident in the transcripts. Some part of language produced by them was accurate. In Pronunciation, L1 influence was noticeable. The

reason could be that certain sound patterns of the English language do not correlate with that of L1 and therefore, transfer of sounds does not take place. Rather, it becomes difficult for the student to master the pronunciation of the English word because of L1 interference. This did not hamper their understanding but most of their answers conveyed their hesitation and they took more time to answer than the allotted time.

The example provided below of the control group, reveals lack of clarity in speech; some words cannot be recognized; fillers are used at frequent places and the script ends with an unclear message.

Pre-test script

Life hacker India site is a give us tip for life and work. They can give instruction about developing some new and good habit make um (( )) stand with a table and firm (( )). In a um open a bottle open a bottle and (( )). It told us about how to create a (( )). You know power of (( )). Also to score good in various um tests. How your memory evokes give about instruction. Or to three way of improve (( )). How to make yourself independent um indi- indi- um (( )). Ok.

For this particular student, in the post-test, the length of the answer increased and it was more specific. Various features of the assigned website were explored and explained clearly by the student. This proves that if the control group students had received similar treatment as the experimental group, improvement could have been seen in these students also.

Post-test script

Um. I visited the website of Pod Academy. It features some audio. Here some video um audio of various topics are given. I just listen to an audio on effective management. It is a very good audio. This website can (( )) {BR} it can help us in getting many knowledge of various sub- subjects. I can see audio on

health, management, psychology, philosophy, self-improvement etc. This videos are um recorded by {BR} people who are expert in their subjects. So they are very useful to us. You must visit this website and hear the audio on it. Thank you.

It was observed that even without formal treatment seven students from the control group were able to express their answers with more confidence and increased comfort level. Since they had an experience of dealing with such activities during the pre-test, they could feel comfortable in their second attempt.

Decreased Scores

In the post- test, 40 students (85.10%) marks decreased by 1-8 marks. This group of students was able to achieve very few simple things of the tasks assigned to them during post-test. Apart from what they could do correctly, most of their responses were inappropriate and at several occasions they did not attempt the questions. Their utterances were limited to single words. The range of language they showed was limited and inadequate to complete the tasks. On some occasions accurate language was observed but frequent inaccuracies prevented the message from being communicated. Their pronunciation was also not clear. Frequent hesitation was observed in their recordings.

The following are pre-test and post-test transcripts of one of the control group students.

Pre-test script

In this following graph {BR} I (( )) observed in two-thousand-eleven um and eleven under digital ad spen- spending {BR} increasing (( )) um twenty-seven point seven percentage and um and in two-thousand-six- sixteen in um five point uh five- five percentage. It is the (( )) decrease. And {BR} (( )) total ad spending in um um two-thousand-ten and two-thousand-six is red line.

In the above transcript one can observe that the student was not comfortable with the task. Some of the words were repeated and there is a presence of fillers in it. Also some of the words were not audible.

No improvement is observed in post-test in case of this student. The following is his post-test transcript for a similar question. One may observe the presence of fillers and some unclear words in the recording. Also the length of the recording remained same as the pre-test answer.

Post-test script

{BR} In this question three- um three charts um graphs is given. They are telling us about um internet users in (( )) US.So there are three graphs. Um we can (( )) um learn about the internet (( )) use in the US. There is percentage in all three cha- um graphs. They tell about different months and the internet.

Given below is another post-test answer transcript which shows no improvement as research intervention was absent to this group.

Post-test script

Um I read the news of Microsoft and- and Nokia. {BR} The news is (( )) talk about the company purchase Nokia. Um the money is five and four billion Euro. Nokia is (( )) making mobile phones, smart phones, ipads etc. Microsoft also make Lumia phones. Um the {BR} Microsoft will install its (( )) windows software in smart- um smartphones.

There is absence of analytical ability, and this was a common feature in many control group students at the time of post-test. Interpretation of data proves that the Internet-based tasks improved speaking skill of MBA students.

4.3.2 Quantitative Analysis of Speaking

Descriptive statistical analysis of the pre-test and post-test results of experimental and control groups was carried out. The following table shows the comparative mean and std. deviation of the test scores of both the groups.

	Mean	N	Std. Deviation	Std. Error Mean
Experimental Group Pre-Test	40.56	50	13.030	1.842
Control Group Pre-Test	47.70	47	16.655	2.429
Experimental Group Post-Test	47.26	50	18.284	2.585
Control Group Post-Test	39.44	47	17.041	2.485

Table 4.4 *Paired sample statistics for experimental group test scores*

In speaking, the overall mean of the pre-test in experimental group was 40.56 and the standard deviation was 13.03. In control group pre-test's overall mean was 47.70 and the standard deviation was 16.65. The overall mean of the experimental group post-test was 47.26 and the standard deviation was 18.28. Whereas, the overall mean and standard deviation in control group post-test were 39.44 and 17.04 respectively.

A paired-sample t-test was conducted to evaluate the impact of the intervention on experimental and control group students' scores in speaking skills. The following table provides the details of T-test results.

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Experimental Group Pre-test Experimental Group Post-test	6.700	5.245	1.166	4.356	9.043	5.746	49	.000
Control Group Pre-test Control Group Post-test	2.255	2.824	.557	1.132	3.378	4.043	46	.000

Table 4.5 *Paired samples test for overall scores*

In speaking, the T-value obtained from the analysis of the overall mean scores of the experimental group pre-test and post-test was 5.746 as against 4.043 of control group. The details of paired T-test analysis for the pre-test and post-test of experimental and groups showed that the P-value or value of significance was 0.000, at the level of 0.05. The analysis shows that there was a significant difference between the overall mean scores of the pre-test and post-test of both groups. The table reveals that the mean score of experimental group was greater (6.700) than the control group's mean score of 2.255. The difference in mean score suggests that there was more improvement in the speaking skills of experimental group than the control group students, the higher improvement not due to chance but due to the research intervention, that is, the Internet and Computer Based Speaking Tasks which were offered to the experimental group students. The quantitative analysis of speaking data thus corroborates the findings of qualitative analysis.

4.3.3 Significant Findings

The significant findings of offering Internet and Computer Based Speaking Tasks to the MBA students are that it:

a) helped them to develop their analytical ability while expressing information orally; they were able to express information in an organized manner having better control over their speech.

b) enabled them to present information in a professional manner; they were able to speak with more clarity and confidence

c) helped them become more comfortable while speaking and enabled them to be more confident in their oral expressions.

Qualitative and quantitative analysis of pre-test and post-test scores of experimental and control group suggest that there was a significant improvement in the Speaking skills of experimental group students. The hypothesis, **Internet and Computer-based Tasks are likely to develop speaking skills of MBA students**, thus is proved positive.

4.4 Self-directed Learning and Motivation

Hypothesis 3. Internet and Computer-based Tasks are likely to develop self-directed learning and motivate them to further develop their communication skills.

The present work placed emphasis on allowing students to learn beyond classroom hours providing them with independence and autonomy in learning. Corroborating studies of Peter (2000), it was found that self-directed learning is quite effective at the university level. The students liked to work on different tasks designed to help them improve their writing and speaking skills. Phongnapharuk (2007), Kim (2010), Suwannasilp (2000) and Saha (2006) also opined that students should be prepared for the rapidly changing environment where they can take up the responsibility of learning and continue their efforts for self-empowerment.

An advantage of engaging students' learning environment with technology is that it makes them feel motivated to participate and learn. Most of the experimental group students expressed their plan to continue their learning efforts in online environments.

An online questionnaire (Appendix IV) was administered after the post-test, for collecting the experimental group students' feedback on tasks that were administered during the research intervention. Another important objective of this exercise was also to analyze the overall impact of the program on their self-learning attitude and motivation, to take up such self-guided tasks on their own.

Analyses of the feedback responses on the Questionnaire (Appendix IV) revealed that almost all the students liked the way of improving their written and spoken communication through the use of ICT. 92% students agreed that use of ICT and Internet and Computer Based Tasks **allowed them to learn in an independent manner** which boosted self-directed learning. 74% students found it easy to take the tasks. They expressed their willingness to use available Internet-based resources to improve their communication skills. 90% students opined that the based tasks gave them enough time to practice writing and speaking.

70% students found the use of videos interesting for improving their speaking skill. **85% students expressed that they would continue using online videos to further improve their presentation and communication skills**. All the students opined that **MS word and blogs allowed them to improve their writing skill**.

72% students liked the use of podcasts for enhancing speaking skills. **88% expressed their plan to continue using podcasts to become fluent speakers of English.** It corroborates the study of Knowles (1975) that showed that the subjects took the learning initiative, utilizing online resources for satisfying their learning needs.

78% students found it beneficial to work in pairs and groups while doing the tasks. They opined that **it helped them in their overall communication development**. This relates to the motivational elements of adjusting into an online learning environment.

Case studies provided 92% of the students an opportunity to learn concepts of their own domain. All of them expressed that the case studies were relevant to other subjects of MBA. 90% students said that **they were now more comfortable giving oral presentations**. 92% students also expressed willingness to undergo such training in future; they also said that they would recommend such trainings for other Management students too. 90% students said that the online tasks were enjoyable and useful.

90% students said that the training program **helped them to be more confident and comfortable while communicating with others**. They also intended to continue using Internet contents to for communication improvement.

74% students stated that **online feedback systems helped them learn on their own by receiving inputs from their classmates**. 90% accepted the positive influence of the peer-feedback approach adopted during the intervention.

The self-directed learning element was further encouraged among students by the fact that 80% of students said that online tools like Google Drive enabled them **to independently learn from anywhere and it helped them learn things on their own**. 80% stated that the **online tasks allowed them to work from outside the classroom** i.e. home and hostel, which was seen as a great advantage. There were 82% students who expressed their **willingness to take up online self-learning tasks for improving their management skills**.

Bates (2005) has opined that online instructional learning environment has several benefits in term of freedom of content, space, medium, access and relationship development (Paulsen, 1993; Anderson, 2006). Motivation is also one of the key factors for online learning environments (Bekele, 2010; Jones & Issroff, 2007). Specifically after the intervention, 90%

students found themselves comfortable working in an ICT learning environment. 92% students expressed their interest in participating such other programs. Though there are limited studies that explore motivation to learn in online contexts (Artino, 2008; Bekele, 2010), observations in the existing works suggest that designing motivating learning environments is very important (ChanLin, 2009; Keller, 2008).

Findings from comparative studies between online students and on-campus students (Rovai, Ponton, Wighting, & Baker, 2007; Shroff & Vogel, 2009; Wighting et al., 2008) suggest that online students are more intrinsically motivated as compared to on-campus students at both undergraduate and postgraduate level. Corroborating these findings, in this study, there were 92% students who liked the tasks given during the intervention and 82% expressed their plans to undertake such communication improvement tasks on the Internet. 93% of the students expressed their opinion that **such kind of tasks can enable them to become better communicators**. Finally 92% students stated that they would recommend such kind of trainings to other Management students.

When it came to the **duration of training**, 30% students said that the **time frame was not sufficient** and more time should be given to such programs. It also proves that the students were engaged and felt motivated to utilize more tasks if they get an opportunity.

4.4.1 Significant Findings

The feedback from the experimental group students revealed that they were able to do the tasks on their own with their peers. It indicated the attitude of development self-learning in them. They expressed that tools can help them to become better communicators and also shared their willingness to use ICT enabled environments for improving their interpersonal skills.

Based on the above observations, the hypothesis **Internet and Computer-based Tasks are likely to develop self-directed learning and motivate them to further develop their communication skills,** proves positive.

4.5 Critical Thinking Skills

Hypothesis 4: Internet and Computer-based Tasks are likely to develop Critical Thinking in MBA students.

Critical Thinking is seen as one of the pre-requisite in today's graduates, especially in management domain where the professionals are required to handle large volumes of information in decision-making (Braun, 2004). As mentioned in Chapter II, Critical Thinking refers to an individual's ability to think and make independent decisions. It aims at solving problems by gaining understanding and evaluating different perspectives.

Critical Thinking has its base in Bloom's Taxonomy (Bloom, 1956) a multi-tiered model of classifying thinking, as it attempted to define the functions of thought, according to six levels of complexity. This taxonomy was later modified by (Anderson and Krathwohl, 2001) which reflected a more active form of thinking. The classification levels of intellectual behavior from 'Remembering to Creating' (Chapter II) provided a tool for measuring thinking in students. The structure of the Revised Taxonomy table matrix, (Chapter II) provides a "clear concise visual representation" of the alignment between standards and educational goals, objectives, products and activities (Krathwohl, 2002).

In the Revised Bloom's Taxonomy, Analyzing, Evaluating, and Creating are considered Higher Order Thinking Skills while Remembering, Understanding and Applying are considered the Lower Order Thinking Skills.

Remembering, a lower order thinking skills reflects the act of recalling knowledge from memory. Remembering is when memory is used to produce or retrieve definitions, facts, or lists, or to recite previously learned information (Wilson, 2015).

The second strategy, **Understanding** means comprehending meaning, and constructing meaning from oral, written, and graphic messages. It also means translating, interpolating, interpreting instructions and problems. Skills of interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining (Wilson, 2015), also fall under this category.

The third strategy, **Applying** means using existing knowledge or new knowledge to a new situation either in the classroom or in the workplace. The learned knowledge is used through models, presentations, interviews or simulations (Wilson, 2015).

Analyzing means breaking any knowledge into its constituent parts and determining how the parts link to one another and to the overall structure as a whole (Wilson, 2015).

The **Evaluation s**trategy engages students in the process of making judgments based on given criteria and standards through checking and critiquing; and also reflects recommendations and reports (Wilson, 2015).

The last and the most difficult among all the six strategies (Leslie, 2015),-**Creating,** requires to put together elements to form a coherent or functional whole. In this study, the students were required to generate, plan and produce texts.

As mentioned in Chapter III, following the Revised Bloom's Taxonomy (Anderson and Krathwohl, 2001), critical thinking skills were embedded in the Internet and Computer-based Tasks that were designed to examine changes in the use of various strategies in the students' speaking and writing skills. Along with the qualitative and quantitative analysis of the students' pre-test and post-test answers, the researcher also evaluated the scripts to examine whether students used Critical Thinking strategies while speaking and writing. An analysis of the thinking strategies used in Writing and Speaking is discussed separately.

4.5.1 Critical Thinking in Writing

The pre-test and post-test answer scripts of the experimental group students were analyzed for the use of Critical Thinking skills by counting the frequencies of all the six categories listed in Revised Bloom's Taxonomy (Anderson and Krathwohl, 2001). Two important observations made were:

1. Increase in the **number of students** using thinking strategies
2. Increase in **number of strategies** used by students

1. Increase in the **number of students** using thinking strategies

Analyzing student data revealed a significant finding that after research intervention, the number of students using the strategies increased. The following table presents the comparative percentage of students in Experimental group using thinking strategies in Writing after research intervention as against the Control Group who had no research intervention.

Strategy	**EG % of students using strategies**	**CG % of students using strategies**	**% of increase of students**
Remembering	100%	94%	6%
Understanding	96%	98%	2%
Applying	94%	90%	4%
Analyzing	92%	87%	5%
Evaluating	93%	86%	7%
Creating	91%	78%	13%

Table 4.6 *Comparison of students using thinking strategies in writing in control group and experimental group*

The above table reveals that due to research intervention there is a significant increase in the **number of students** using all strategies in the experimental group as against the control group. As one observes, the average increase in students is 6%; that is, in each strategy 6% more students used the strategy. However, if one observes the increase in each

strategy individually, there is a significant increase in students using the strategy of creating (13%), followed by, evaluating (7%), remembering (6%) and analyzing (5%). One also has to bear in mind that out of the four thinking skills, creating, evaluating and analyzing are considered higher order thinking skills. Therefore, the increase in students using these strategies means that if students are challenged to use thinking skills through tasks in their classrooms, they can achieve it with appropriate support or scaffolding. The increase in the 'creating' strategy reveals interesting observations. The socio-economic structure in the state of Gujarat, presently where this study is conducted is primarily entrepreneurship oriented. Therefore it can be said that seeds and threads of entrepreneurship are ingrained in students and when they were given the tasks of creating, it triggered off their innate abilities which were lying dormant. Seizing the opportunity presented, they used their background knowledge, learned knowledge and knowledge of the society to create something new. Given these two significant observations, it becomes important that teachers need to create tasks that challenge their thinking capabilities and help them develop their skills in order that they become successful in their careers.

Even **within** the Experimental group you can observe changes in the pattern of strategy use.

	Pre-test	**Post-test**	
Strategy	**% of students using strategies**	**% of students using Strategies**	**% increase in students using Strategies**
Remembering	98%	100%	2%
Understanding	99%	96%	-3%
Applying	89%	94%	+5%
Analyzing	87%	92%	+ 5%
Evaluating	87%	93%	+6%
Creating	84%	91%	+7%

Table 4.7 *Comparison of students of experimental group using strategies in writing - pre-test and post-test*

From the above table it can be clearly observed that Research intervention has really helped **more number of students** to use more strategies. It is likely that during Pre-Test students were unable to understand and comprehend the approach needed to solve the tasks. However, the research intervention triggered off their thinking skills and more number of students comprehended how to approach and solve the given tasks resulting in more number of students using the strategies. The significant part of this observation was that more number of students used the 'creating' strategy (7%). However, the strategy of 'understanding' was used less by 3% of students. It is likely that that the use of this strategy transferred to the strategies of evaluating, analyzing and applying finally resulting in creating which saw a large number of students using it. As mentioned earlier, threads of entrepreneurship innate in students perhaps triggered off in more number of students creating something new.

Apart from that they could have also ben benefited by group work since they were made to complete the tasks in pairs or groups. Also intrinsic motivation, personal determination to excel and the use of online tools for completing the tasks helped more number of students to use strategies.

2. Increase in **number of strategies** used by students

The second significant observation was the increase in the number of strategies used by students and the kind of strategies they had used.

Strategy	Pre Test No. of strategies used by students	Post Test No. of strategies used by students	Increase in the number of strategies used
Remembering	46	54	8
Understanding	51	52	1
Applying	50	55	5
Analyzing	45	54	9
Evaluating	41	53	12
Creating	43	54	11

Table 4.8 *Increase in number of strategies used by experimental group students*

From the above table one can observe a significant shift in the Higher Order Thinking Skills in students' writing from pre-test to post-test.

Here is an example of the use of these strategies in writing by one of the experimental group students during post-test.

Post-Test

This paragraph explains about the forecasting and its importance in sales and marketing. The expenditure analysis can help in making right projections. Depending on the sales, direct cost goes up or down. Companies go for sales forecasting in their budget reports. It is possible to do exact forecast by analyzing the key aspects like production, marketing and sales.

The answer reflects the use of Analyzing and Evaluating strategies.

The underlined phrases in the example presented above represents the result of research intervention. The tasks given to students comprised written excerpts from reports published by various companies and video presentations on business and communication. The use of this content helped the students use the terminology which was used in what they read what they saw. The use of such content in the tasks gave them exposure to the real-world business environment and helped them develop the use of their thinking skills.

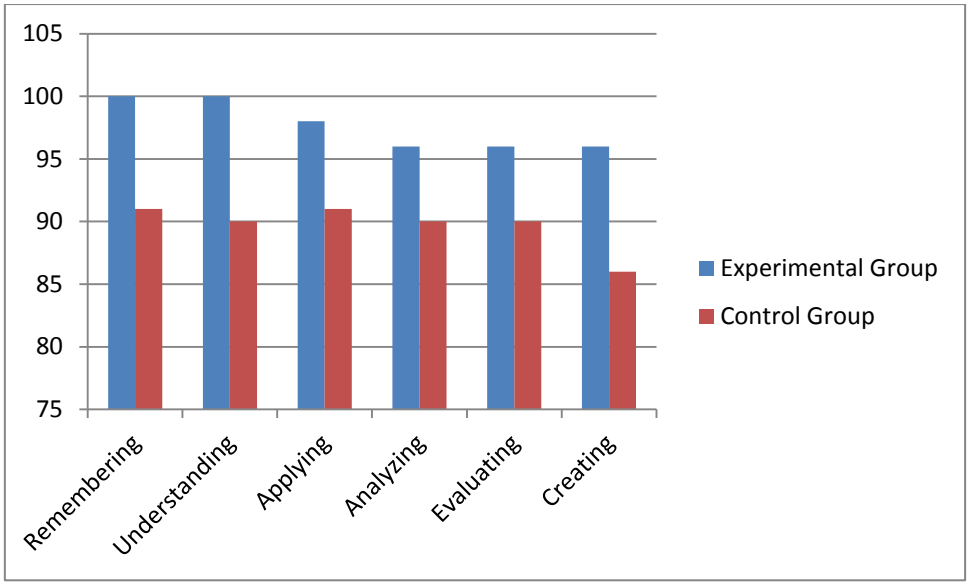

Figure 4.1 *Use of CT Strategies in Writing Post-Test by Experimental and Control Group*

When graphically presented, the figure 4.1 reflects a clear shift in students of experimental group using more Higher Order Thinking Skills than Lower Order Thinking Skills.

4.5.1.1 Comparison of the Pre-Test and Post-Test Strategy use in Writing in Control Group and Experimental Group

The data also reveals that not only in individual strategy use but also cumulatively, the experimental group benefitted from research intervention leading to the increased use of higher order thinking skills as compared to the control group who had no intervention. The following table reveals the pre-test strategy use of the experimental versus the control group.

Strategies	EG Frequency count Pre-test	CG Frequency count Pre-test	Increase/Decrease in strategy use
Remembering	46	55	-11
Understanding	51	54	-3
Applying	50	50	0
Analyzing	45	51	-6
Evaluating	41	52	-11
Creating	43	50	-7

Table 4.9 *Pre-test - strategy use in writing- experimental group and control group*

From the above table it is clear that the Experimental group students had no clue as to how the tasks had to be approached and solved. In fact, as the frequency counts reveal the Control group students seem to have done better than the Experimental group students in using the strategies of evaluating (-11), creating (-7) and analyzing (-6). However, the research intervention given to the Experimental group and the data gathered through the post-test reveals that after research intervention the Experimental students fared better in strategy use than the control group students. The following table makes it clearer.

Strategies	EG Frequency count Post-test	CG Frequency count Post –test	Increase/Decrease in strategy use
Remembering	54	47	-7
Understanding	52	50	+2
Applying	55	51	+4
Analyzing	54	46	+8
Evaluating	53	47	+6
Creating	54	45	+9

Table 4.10 *Post-test - strategy use in writing - experimental group and control group*

The data reveals that research intervention helped the students to use strategies and especially change is noticeable in the use of the strategies creating (+9), analyzing (+8),

evaluating (+6). This means that the online tools and the internet based tasks that were given to them as research intervention helped them understand how to analyze, evaluate and finally to create. The experimental group students strengthened their critical thinking skills along with the writing and speaking skills with the technology-based intervention.

The analysis therefore proves that incorporation of Internet and ICT-based tools helps MBA students enhance their critical thinking skills in writing. Since the tasks were based on Revised Bloom's Taxonomy, the positive shift in students' critical thinking skills, it is concluded that the ICT tasks based on the taxonomy played the pivotal role in the improvement.

4.5.2 Critical Thinking in Speaking

In speaking too, the pre-test and post-test transcripts of the Experimental and Control groups were analyzed for the use of Critical Thinking Skills by counting the frequencies of all the six categories listed in Revised Bloom's Taxonomy (Anderson and Krathwohl, 2001). Two important observations made were:

1. Increase in the **number of students** using thinking strategies
2. Increase in **number of strategies** used by students

1. Increase in the **number of students** using thinking strategies

The following table presents the comparative percentage of students in experimental group using thinking strategies in Speaking after research intervention as against the control group who had no research intervention.

Strategy	EG % of students using strategies	CG % of students using strategies	% of increase of students
Remembering	100%	91%	9%
Understanding	100%	90%	10%
Applying	98%	91%	7%
Analyzing	96%	90%	6%
Evaluating	96%	90%	6%
Creating	96%	86%	10%

Table 4.11 *Comparison of students using thinking strategies in speaking in experimental group and control group*

The above table shows that there is a significant increase in the **number of students** using all strategies in the experimental group as against the control group. As one can observe, the average increase in students is 6%; that is, in each strategy 6% more students used the strategy. However, if one observes the increase in each strategy individually, there is a significant increase in students using the strategies of creating and understanding (10%), followed by remembering (9%), applying (7%) and finally analyzing evaluating (6%). There was a significant improvement observed in higher order thinking skills strategies - creating, evaluating and analyzing along with the three other. Thus creating tasks that challenge the thinking capabilities of the management students can help them develop their critical thinking skills.

Similar to the use of critical thinking skills in writing, in speaking too, **within** the experimental group you can observe changes in the pattern of strategy use.

Strategy	Pre-test % of students using strategies	Post-test % of students using Strategies	% increase in students using Strategies
Remembering	96%	100%	4%
Understanding	90%	100%	10%
Applying	90%	98%	8%
Analyzing	88%	96%	8%
Evaluating	93%	96%	3%
Creating	85%	96%	11%

Table 4.12 *Comparison of students of experimental group using strategies in writing - pre-test and post-test*

The above table shows that Research intervention has really helped **more number of students** to use critical thinking strategies. It is likely that during Pre-Test students were unable to understand and comprehend the approach needed to solve the tasks. However, similar to writing skills, the research intervention triggered off the thinking skills of experimental group students and more of them comprehended how to approach and solve the given tasks resulting in more number of students using the strategies. The significant part of this observation was that more number of students used the ‘creating’ strategy (11%).

2. Increase in **number of strategies** used by students

The second significant observation in speaking was the increase in the number of strategies used by students and the kind of strategies they had used.

Strategy	Pre-Test No. of strategies used by students	Post-Test No. of strategies used by students	Increase in the number of strategies used
Remembering	54	59	+5
Understanding	52	60	+8
Applying	46	51	+5
Analyzing	42	52	+10
Evaluating	39	50	+11
Creating	40	53	+13

Table 4.13 *Increase in number of strategies used by experimental group students*

As the above table shows, there was a significant improvement in the use of analyzing, evaluating and creating strategies. Here is an example of the use of these strategies in writing by one of the experimental group students during post-test.

Post-Test

This paragraph is about the acquisition of Nokia by Microsoft for €5.4 billion. One of the factors because of which Microsoft bought Nokia is the popularity of its products Lumia and Asha. Nokia sold 54 million devices in second quarter of 2013. Microsoft may benefit from the acquisition if the company is able to combine the services and brands like Windows, Nokia, Live, Surface, Xbox, and Bing. Also according to this para Nokia dominates most of the global cell phone markets with 40% in European countries which can help Microsoft in selling more and more devices.

The underlined phrases in the example presented above represents the result of research intervention. The use videos and reports helped the students to use the terms in what they read what they saw. The use of such content in the tasks gave them exposure to the real-world business environment and helped them develop the use of their thinking skills.

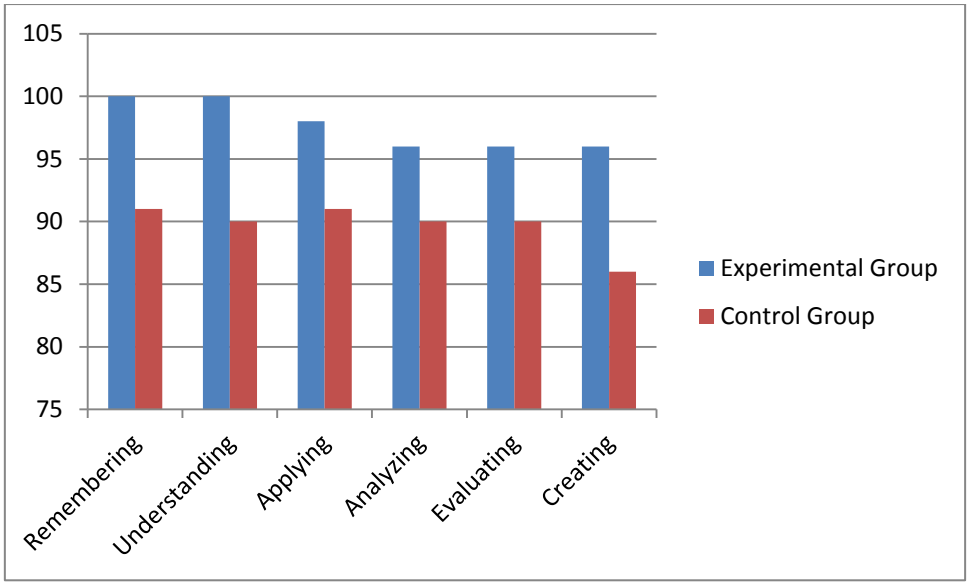

Figure 4.2 *Use of CT Strategies in Speaking post-test by experimental and control group*

As shown in the figure 4.2, there was a noticeable improvement in the usage of Critical Thinking skills by the experimental group students over the control group.

4.5.2.1 Comparison of the Pre-Test and Post-Test Strategy use in Speaking in Control Group and Experimental Group

As seen in writing, the data from speaking pre-test and post-test revealed that not only in individual strategy use but also cumulatively, the Experimental group benefitted from research intervention leading to the increased use of higher order thinking skills as compared to the Control group which was not offered the intervention. The following table reveals the pre-test strategy use of the experimental versus the control group during the speaking.

Strategies	EG Frequency count Pre-test	CG Frequency count Pre-test	Increase/Decrease in strategy use
Remembering	54	52	+2
Understanding	52	55	-3
Applying	46	53	-13
Analyzing	42	50	-8
Evaluating	39	51	-12
Creating	40	51	-11

Table 4.14 *Pre-test strategy use in speaking- experimental group and control group*

The above table shows that Experimental group students used lesser Higher Order Thinking Skills strategies at the time of post-test. According to the frequency counts Control group students seem to have done better than the Experimental group students in using the strategies of evaluating (-12), creating (-11) and analyzing (-8). However, the research intervention given to the Experimental group and the data gathered through the post-test reveals that after research intervention the Experimental students fared better in strategy use than the control group students. The following table makes it clearer.

Strategies	EG Frequency count Post-test	CG Frequency count Post -test	Increase/Decrease in strategy use
Remembering	53	51	+2
Understanding	54	50	+4
Applying	52	51	+1
Analyzing	52	47	+5
Evaluating	50	45	+5
Creating	53	43	+10

Table 4.15 *Post-test strategy use in speaking- experimental group and control group*

The above table reveals that research intervention helped the students to use strategies and the change is noticeable in the use of the strategies creating (+10), analyzing (+5) and evaluating (+5). This means that the online tools and the Internet-based tasks helped them

understand how to analyze, evaluate and create. The experimental group students strengthened their critical thinking skills along with the writing and speaking skills with the technology-based intervention.

Similar to the use of Critical Thinking skills in writing, in speaking too the Experimental group students fared better than the Control group students. Thus, Revised Bloom's Taxonomy based ICT tasks enabled the students to achieve positive shift in critical thinking skills.

As mentioned in Chapter I, today's managers are expected to be effective in analyzing, communicating and convincing people to achieve set goals. The tasks designed in the present study helped develop such skills among the students of Management.

4.5.3 Significant Findings

The analysis of the writing and speaking pre-test and post-test answers of both the groups showed a significant improvement in the use of Higher Order Thinking Skills by the experimental group students. A clear shift to the use of Analyzing, Evaluating and Creating was observed in the experimental group as against the control group students. Based on these observations the hypothesis **Internet and Computer-based Tasks are likely to develop Critical Thinking in MBA students** proves positive.

4.6 Conclusion

This chapter presented the analysis and interpretation of the data collected using writing and speaking pre-test and post-test from the MBA students. The study proves all hypotheses with qualitative and quantitative analysis thus establishing that Internet and Computer-based Tasks helped the MBA students in developing their productive skills. The analysis of the data collected from the pre-test and post-test scores rejected the null hypotheses. Thus data analysis and its interpretation showed that Internet and Computer-

based Tasks help MBA students in developing their writing, speaking and critical thinking skills.