

E-Learning at Semi-Urban College in Chennai – An Experimental Study of Undergraduate Students of Commerce

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Abstract:

E-learning is a formalized teaching-based learning system that makes use of electronic resources. The delivery of education to a large number of receivers at the same or various times through digital aids and internet is known as e-learning. It wasn't widely accepted in the past since it was thought that this method lacked the human component needed for learning.

But thanks to the quick development of technology and learning methods, e-learning now widely accepted. This revolution began with the advent of computers, and as time went on, people became dependent on smartphones, tablets, and other gadgets, these technologies began to play a significant role in education in schools and colleges. The Internet, which is available around-the-clock, anywhere, at any time, has made information dissemination instant, quicker, and easier .

This paper is an attempt to understand the impact of e-learning and its acceptance among the college students from a college located in a semi-urban area of Chennai. An experimental study was conducted by introducing selected students to e-learning and comparing their performance in the semester exams with that of their peers who were exposed to traditional way of teaching.

Keywords: *E-learning, Experimental Group, Control Group, Traditional teaching*

Introduction:

Advances in Information Technology have brought disruptive changes in the education sector. The Covid-19 pandemic was a catalyst for all the changes that happened in the education industry. Nearly 247 million of school and college-going students were held up at home for nearly one and half years during the pandemic without physical access to schools/ colleges^[1] The Academicians quickly resorted to technology through various tools and methods keeping the education system alive.

The COVID-19 pandemic marked the renaissance of E-learning. Thanks to internet connectivity, the majority of the students have access to digital materials and content today. Scanned materials, Presentations, Videos, Quizzes, and other digital content have supplemented and in some cases substituted books. Regular Classroom teaching using Blackboard has been replaced by presentations through projectors in smart classes, or online classes through virtual online meetings through Zoom, Webex, Google, etc.

Such transitions have become the norm of the day. But there is a lot of debate on this transition. Is this a healthy transition? Will students of all categories benefit from such a transition – Slow, Medium, and Advanced learners? Is e-learning through videos and digital learning beneficial to students?

One of the Learning Delivery Modalities (LDMs) created by the DepEd as Distance Learning Modes (Llego, 2020) is an online instruction program. This modality has gained popularity as a result of the global CORONA-virus epidemic (WHO, 2020). In fact, some of the top universities have been using this type of modality to complete some of their degree programs offered in higher education programs, particularly in postgraduate courses and adult education programmes. This study acknowledges the need to account for and provide basic information on some important components of this new teaching style, such as motivation and engagement, given the significance of this new teaching style.

Review of Literature

Gunasekaran Ronald & McNeil, Dennis shaul (2002) examined E-learning: Research and applications. The study concluded that E-learning plays a significant role in all business sectors. In addition to its cost-effectiveness, its key advantages are its flexibility, user ease, vast reach, quick accessibility, consistency, and repetition. The goals of e-learning are determined by the effectiveness of online access and the quality of the educational process.

Albert Sangrà, Dimitrios Vlachopoulos, and Nati Cabrera (2012) ^[2] studied the e-learning subject to a high degree of consensus that will provide a useful conceptual framework and done review of literature to identify the different models in which e-learning is developed and practiced. Finally they classified the e-learning into four general categories - 1) technology-driven, 2) delivery-system-oriented, 3) communication-oriented, and 4) educational-paradigm oriented.

Dr Showkeen Bilal Ahmad Gul (2015) ^[3] performed an exploratory study on e-learning revolutionizing the education system. E-learning is the process of two parties participating in the educational process, interact through compact discs, multimedia, satellites, or other new education technologies to achieve specific educational objectives and he concluded that through e-learning students can access educational materials at any time and from any place, thereby transforming the concepts of the educational process and learning to go beyond the limits imposed by traditional classrooms into a rich environment in which there are numerous sources of learning.

Mohammed Mohammed Nasser Hassan Ja'ashan(2020) ^[4] The problems that students confront when learning English as a foreign language at the University of Bisha were examined. According to the findings of the study, the main hurdles of E-learning at the University of Bisha were academic, administrative, and technical challenges. The findings also suggest that students are aware of the advantages of embracing E-learning. They believe they have a very good attitude towards English E-learning. The biggest advantage is that it may be utilized anywhere, at any time, and that the E-learning system can adapt to the goals of increasing communication and enriching students' learning experiences.

Papageorgiou (2021) ^[5] studied the student's perceptions of Learning, using interactive notes. The study focused on teaching should be to encourage and promote learning, through interactive notes. The researcher discovered that the study's worth contributes to research information in addressing first-year students' learning perspectives in a more effective learning environment.

The Advantages of Online Teaching and Learning

The ease of not having to physically attend class is the most evident benefit of online teaching and learning approaches. It serves the growing population of online learners who are unable to participate in regular classroom settings or who choose not to do so. These students, according to Stern (2019), include those who can't attend traditional classes, can't find a particular subject at their preferred institution, live in remote areas, work full-time jobs and can only study in the mornings or evenings, and just prefer to learn independently.

- **Convenience:** 24/7 access from any computer with an internet connection; fits busy schedules; no commuting; no parking search.

- **This levels the playing field and makes timid students more comfortable.** The online setting is anonymous, and students can take more time to think and reflect before speaking. Innovative teaching includes student-centered strategies, increased variety and creativity in learning activities, and **accommodations for various learning preferences**
- **More time to study student work in-depth;** ability to record and document online exchanges; capability to handle grading online.
- **More students can be accommodated,** and higher retention rates and fewer repeats result from improved student satisfaction.
- **Maximize Physical Resources:** Lessen the strain on the college's meager infrastructure and the parking lot and campus traffic.
- **Outreach:** To expand enrollments, give students options, tap into new student markets, and appeal to current students.

The learner is a unique person; and his profile may be defined by several attributes like

- ✓ The student's upbringing and culture.
- ✓ The student is now more accountable for their education.
- ✓ The satisfaction of completing challenging tasks inspires learning.
- ✓ Learning is an active, social process characterized by the dynamic interaction between task, instructor, and learner.
- ✓ Instructors function as facilitators, supporting students in developing their own grasp of issues.

The Experiment:

Anxious to know the impact of online teaching (digital teaching) on students learning at arts and colleges, the researchers who are Assistant Professors in the Commerce Department of an Arts & Science College in the suburbs of Chennai, endeavored to assess the impact of E-learning on Commerce student's academic performance. The College is located in a semi urban areas of Chennai and caters to nearly 7000 women students enrolled in various programs.

A sample set of students were identified. Instead of teaching in the classroom using a blackboard, video-based sessions were provided to the students. The videos were recorded versions of typical online classes. The Classroom sessions were utilized as a study time for the students to watch the videos prescribed for the class. The teacher was around to ensure that the students watched the prescribed videos and to clarify any doubts.

The two questions examined in the study are

1. Is there a significant difference in the academic performance of students who learned through the digital mode
2. Whether students felt comfortable with self-learning using digital options. What is their feedback?

The reason and the need for the study

- The sudden shift to technology-enabled learning during pandemic has left many educators wondering whether they are on the right track. So it is important to understand whether digital self-learning really benefits students without affecting their performance
- Is the human connection in teaching essential at the college level?
- Can teaching be replaced by Self –learning e-programs under a monitored environment, supported by a facilitator
- If digital adaptation is beneficial to all categories of students, the teachers/ lecturers have to be prepared to adapt to the change quickly.

- The role of teachers and lecturers would become that of Content developers and Facilitators if the results of the experiment indicate the same.

Overview of the Experimental Study:

The experiment was conducted on Commerce students enrolled in the B.Com (Gen) course offered in the Self-finance stream of the college. The B.Com(Gen) course is a three-year U.G program. In the college, B.com(Gen) course is offered in 4 sections namely A,B,C, and D with a sanctioned strength of 70 students in each section. The experiment is conducted only on A, B, and C sections in Shift 2 of the Self-Finance Stream. The program offers both theory and accountancy papers to the students.

The students are comfortable learning theory-oriented papers from books with minimum support from the staff. So the transition to digital learning using digital content was easier.

Teaching accounting papers in a classroom by a teacher involves

- Explaining the steps involved,
- Clarifying doubts immediately,
- Interacting with students to assess their understanding
- Peer learning

These aspects are absent in self-learning video classes. But there are several advantages of digital learning like Any time access, Repeated viewing, Learning at own pace, Timesaving

Methodology

Sampling Areas Covered for the Study	An Arts & Science College in Chennai – B.Com(Gen) program – I, II, III year students in 3 sections	
Data Source	Primary and Secondary data	
Sample size	69+70+69 = 208	Experimental Group
	137+154+146 = 437	Control Group
Sampling Method	Stratified random sampling	
Data Instrument	G-forms (Feedback only)	
T Type of Research	Experimental	
Data collection process	Published Semester Exam marks	

The Experiment Design:

During the Academic year 2022-23- Even semester falling in the period November 2022 - April 2023, One Class from the First year 2022-25 batch, One from the Second year 2021-24 batch, and One from the Final year 2020- 23 batch were chosen to constitute the experimental group.

This group was introduced to Self-learning videos that were recorded versions of a typical online class. During regular classhours, the students were asked to watch the videos using their mobile phones and work out the problems in their notebooks, just as they would watch a teacher teaching on the blackboard and work out in a normal classroom session.

Figure 1 :The Subjects offered on an experimental basis:

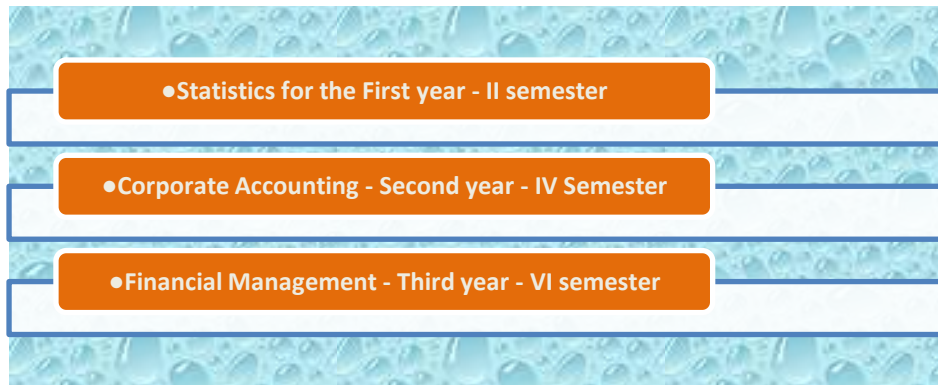


Figure 2: Experimental And Control Groups:



The Experimental group –

This refers to the group being introduced to Self-learning videos that were recorded versions of a typical online class. The details of the profile of the experimental group is given below

Figure 3: The Experimental Group



(#) Note:

- **The First year** - C section - 2022-25 batch - The experimentation methodology was slightly different from that of the other 2 groups - Second year and Third year.
- **The Second and Third-year students** were **engaged during class hours**, by asking them to watch the specified videos and then working on the problems in their class work, under the supervision of the staff.

- For the first-year students due to time constraints, only 50% of videos were shared and worked during class hours under the supervision of the staff. The rest of the videos **were shared with the students for working at home.**

The Control Group

- This refers to a group of students who will be included in the study. But they will not be subject to the controls. They were exposed to regular blackboard teaching.
- They are not exposed to e-learning as the Experimental Group
- So the Control group comprises the other 2 sections

Table 1 : Experimental And Control Group - Batches

EXPERIMENT NO	Subject (*)	Experimental	Control
EXPERIMENT 1	Statistics & OR II	I year C section	I year A & B section
EXPERIMENT 2	Corporate Accounting	II year B section	II year A & C section
EXPERIMENT 3	Financial management	III year B section	III year A & C section

(*) – Syllabus content provided in the Annexure

EXPERIMENTS

EXPERIMENT 1: Comparison of the Overall performance of the Experimental group with that of the Control group - (Z -test comparison of means of two samples)

Figure 4: THE EXPERIMENT1 – OVERALL PERFORMANCE



EXPERIMENT 2: Comparison of performance in E-learning subject of the Experimental group, with that of the Control group- (Z -test comparison of means of two samples)

Figure 5: THE EXPERIMENT2 – E-LEARNING SUBJECT

– EXPERIMENTAL vs CONTROL GROUP



Experiment 2.1 - First year - Second Semester - (Exp Grp - C Sec –Subject: Statistics &OR2

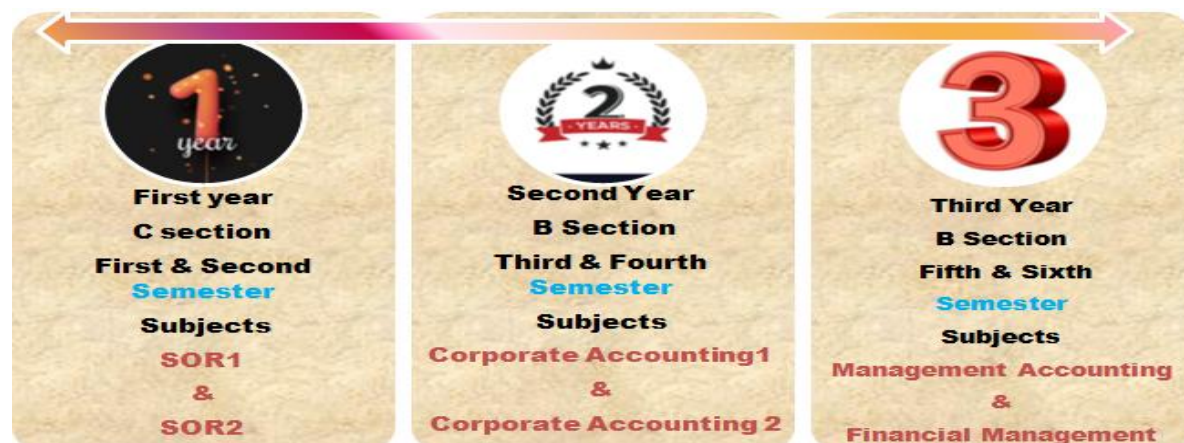
Experiment 2.2 - Second Year - Fourth Semester (Exp Grp - B Sec - Subject Corp ac2)

Experiment 2.3 - Third Year - Sixth Semester (Exp Grp - B Sec - Subject Financial Management)

EXPERIMENT 3: Comparison of performance of Experimental Group in E-learning subject in even sem, with performance in the part1 of the same/similar subject in the previous semester - (paired t-test)

Figure 6: THE EXPERIMENT 3 – E-LEARNING SUBJECT

– CURRENT SEM vs PREVIOUS SEM PERFORMANCE



Experiment 3.1 - First yr C section - First & Second Sem.- (Subjects Statistics & OR1& SOR2

Experiment 3.2 - Second Yr. B SEC- Third & Fourth Sem. - Subjects: Corporate Accounting1 & Corporate Accounting 2)

Experiment 3.3 - Third yr. - B Section- Fifth & Sixth Sem. - Subjects: Management Accounting & Financial Management)

Data Collection & Analysis An Overview:

The Data set comprises the **marks at the End of the Semester** for the Control group and the Experimental group.

- **End Semester Marks-** April 2023 in all subjects were downloaded for the batches under study , both Control and Experimental.

- The Experimental group is exposed to e-learning for **one of the subjects**
- The Control group has undergone black board teaching for all subjects
- A comparison of the **Overall marks** of the **Control group** and **Experimental group** is done to ensure that the experimental group does not differ from the other students
- A comparison of **Marks in the E-learning subject** between the **Control group** and **Experimental group** is done, to ascertain the difference in performance in the subject because of E-learning in the experimental group
- A comparison of Marks in E-learning Subject papers with marks for the same or similar subject paper in the **Previous semester and the current semester** is done to check the difference in the performance of the **experimental group** under **normal learning** and **E-learning**

DATA & ANALYSIS

Z-test

$$Z = (X_1 - X_2) / \sqrt{(s_1^2/n_1) + (s_2^2/n_2)}$$

- X_1 = Mean of Sample1, X_2 = Mean of Sample2,
- s_1 = Std of Sample1, s_2 = Std of Sample2
- n_1 = Number of elements in Sample1
- n_2 = Number of elements in Sample2

Table value of Z at 5% = 1.96, p = 0.05

If the calculated value is lesser than or equal to the Table value of 1.96, accept the null hypothesis.

H0: There is a significant difference in performance between the two samples

If the calculated value is greater than the Table value of 1.96,

accept the alternate hypothesis.

H1: There is no significant difference in performance between the two samples

EXPERIMENT 1. Comparison of Overall Performance

H0: There is no significant difference in the Overall Performance of the Experimental group and Control group

TABLE 2: Comparison of Overall Performance – Experimental & Control group

Performance Criteria	Experimental Group	Control Group	Result
Semester 2 - Overall average marks in all subjects	I year C section- 2nd Semester $n_1 = 69$ Mean1 = 68 Stdev1 = 6.88	I year A & B section 2nd Semester $n_2 = 137$ Mean2 = 67.37 Stdev2 = 6.73	$Z = 0.624832$ $p = 0.53$ Result= There is no significant difference
The test statistic Z equals 0.624832, p = 0.53. There is no significant difference in the overall performance of the experimental and control groups.			

Semester 4- Overall average marks in all subjects	II Year B section- 4th Semester n1 = 78 Mean1 = 67.97 Stdev1 = 7.50	II year A & C section- 4th Semester n2 = 154 Mean2 = 68.49 Stdev2 = 6.41	Z = -0.5231 p = 0.6 Result=There is no significant difference
The test statistic Z equals -0.523159, p = 0.6 There is no significant difference in the overall performance of the experimental and control groups.			
Semester 6- Overall average marks in all subjects	III Year B section- 6th Semester n1 = 77 Mean1 = 72.35 Stdev1 = 5.91	III years A & C section- 6th Semester n2 = 146 Mean2 = 72.02 Stdev2 = 5.42	Z = 0.683 p = 0.407 Result= There is no significant difference
The test statistic Z equals 0.683, p= 0.407805, There is no significant difference in the overall performance of the experimental and control groups.			

EXPERIMENT 2 -Comparison of performance in the subject offered, between the Experimental group (through e-learning) and the control group (normal mode)

H0: There is no significant difference in Performance due to Self- the E-learning program -The subject offered

TABLE 3: Comparison of Performance in subject offered in e-learning –

Experimental Vs Control group

Performance criteria- Sem marks in	Experimental Group	Control Group	Result
Statistics & OR II	I year C section- 2nd Semester n1 = 69 Mean1 = 67.87 Stdev1 = 9.22	I year A & B section 2nd Semester n2 = 137 Mean2 = 72.83 Stdev2 = 7.44	Z = -3.88 p = 0.00010 Result= There is a significant difference
- The test statistic Z equals -3.877786, pvalue equals 0.000105411 There is a significant difference in the performance of the two groups. The mean score of the Experimental group is lower than that of the Control group by 4.96 marks			

Corporate Accounting II	I Year B section- 4th Semester n1 = 78 Mean1 = 65.57 Stdev1 = 12.81	II year A & C section- 4th Semester n2 = 154 Mean2 = 63.79 Stdev2 = 9.39	Z = 1.478 p = 0.139 Result= no significant difference
- The p-value equals 0.139255. - The test statistic Z equals 1.478571, There is no significant difference in the performance in the subject Corporate Accounting II (Second year 4th Sem) between the experimental and control groups.			
Financial Management	III Year B section- 6th Semester n1 = 77 Mean1 = 72.353 Stdev1 = 5.907	III year A & C sec. 6th Semester n2 = 146 Mean2 = 72.020 Stdev2 = 5.419	Z = 0.411 p = 0.680 Result= no significant difference
- The p-value equals 0.680573, Z equals 0.411681, which is in the 95% region of acceptance: [-1.959964 : 1.959964]. There is no significant difference in the performance in the subject Financial Management (Third year 6th Sem) of the experimental and control group.			

EXPERIMENT 3: Comparison of performance of before and after e-learning.

Comparison of Experimental Group in E-learning subject in even sem, with performance in the part1 of the same/similar subject in the previous semester(**paired t-test**)

H0: There is no significant difference in the Performance due to E-learning program on the Performance of Experimental batch before and after e-learning

TABLE 4: Comparison of Performance before & after e-learning

Performance criteria- Sem marks in	Experimental Group	Control Group	Result
Statistics & OR I Vs Statistics & OR II	I year C section- 2nd Semester Statistics & OR II n1 = 69 Mean1 = 67.87 Stdev1 = 9.22	I year C section- 1st Semester Statistics & OR I n2 = 69 Mean2 = 72.25 Stdev2 = 9.81	t = 0.0502 p = 0.0001 Result= There is a significant difference between the means at 5% level

- **There is a significant difference in the performance in the semester exam: I semester and II semester, for the subject Statistics & Operations Research.**
- In the Second-semester examination,(under experiment) the **AverageMark in the subject Statistics & OR was lower by 4 marks for the C batch the experimental group** compared to the Average marks in the First-semester
- In the Second-semester examination, the **AverageMark in the subject Statistics & OR was higher by 3.2 marks for Control group (A&B) batch** compared to the Average marks in the First Semester
- During the First semester - A regular teaching method was followed; Second Semester - Video-based Self-learning teaching method was followed.
- **Experiment indicates decline in performance before & after the experiment.**

Corporate Accounting I Vs Corporate Accounting II	II Year B section- 4th Semester n1 = 78 Mean1 = 65.52 Stdev1 = 12.69	II Year B section- 3rd Semester n2 = 78 Mean2 = 71.03 Stdev2 = 8.52	t = 3.0470 p = 0.0032 Result= There is a significant difference between the two means. The mean of Corporate 2 minus Corporate1 equals - 5.51
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- **There is a significant difference in the performance in the semester exam: III semester and IV semester, for the subject Corporate Accounting.**
- In the Fourth-semester examination, the Average Mark in the subject, Corporate Accounting for Experimental group was lower by 5.51 marks compared to the Average marks in the Third Semester
- The difference in mean scores between Corporate1 & Corporate2 for batches (A&C) -the Control group is $(63.79-71.09) = -7.30$ (ie decrease in marks by 7.30 marks)
- There is a decrease in mean marks for both the experimental and control groups while comparing Corporate Accg1 and Corporate Accg2 performance.
- Favorable indication is that the decrease is lesser ,5.51 marks for experimental group against 7.30 marks for Control group.
- We can attribute the difference to the subject difficulty level in fourth Semester
- Note: Semester 3 was conducted under the regular learning method and for Semester 4 Video-based Self-learning teaching method was followed.

Management Accg Vs Financial Management	III Year B section- 6th Semester Financial Management n1 = 77 Mean1 = 65.73 Stdev1 = 8.12	III Year B section- 5th Semester Management Accg n2 = 77 Mean2 = 77.96 Stdev2 = 7.67	t = 9.6077 p = 0.0001 Result= The mean difference is statistically significant
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The mean of Financial Mgt minus Management ac equals for B batch (Exp. group) is -12.23

The mean difference between Financial Management & Management Accounting for (A&C) section is $(65.45 - 78.02) = -12.57$

Since there is a decrease in mean marks for both the experimental and control groups while comparing Financial Management and Management Accounting performance, We can say that the difference is due to the subject difficulty level

Student Feedback

Periodic student feedback was taken in the class to improvise or facilitate the Video-based Self-learning practice before the exams. The Semester exams were scheduled for April 2023, with practical exams beginning in March. Feedback was taken from the students in Feb 2023 to assess whether the students found the method adequate.

The questions and the feedback are given below:

TABLE 5: Students E-learning feedback- summary

Question	I year	II year	III year
Is video-based Self-learning convenient & useful to you?	YES - 23 NO - 5 TOTAL = 28 Yes = 82%	YES = 37 NO = 1 TOTAL = 38 YES = 97%	YES = 45 NO = 2 TOTAL = 49 YES = 91.8%
Is this method better than online classes?	YES = 18 NO = 10 TOTAL = 28 Yes = 64 %	YES = 38 NO = 0 TOTAL = 38 YES = 100%	YES = 45 NO = 2 TOTAL = 49 YES = 91.8%
Is this method better than regular classes using Blackboard?	YES = 10 NO = 18 TOTAL = 28 Yes = 36 %	YES = 18 NO = 20 TOTAL = 38 YES = 47%	YES = 41 NO = 8 TOTAL = 49 YES = 83.6%
Do you want your staff to continue this and supplement our classes with self-learning videos?	YES = 15 NO = 13 TOTAL = 28 YES = 54%	YES = 28 NO = 0 TOTAL = 38 YES = 100%	YES = 43 NO = 6 TOTAL = 49 YES = 87.7 %

Student Comments About Self-Learning Videos Classes: (Italic & Bold Font->Favourable)

TABLE 6: StudentsComments on e-learning experience

III YR	According to me, Offline Classes are better than Online or Video based Classes. Regular blackboard classes are better than video or online classes because when we learn through direct classes, we can clarify our doubts then and there! But in online or video-based classes, as though it will be convenient, it will never be equal to that of direct, regular classes. <i>*Video classes are useful for future reference , *It is very easy and convenient</i> <i>*I am convenient , *It's easy to listen without any distractions</i> <i>*It is easy to understand and can rewind and see if there is doubt in that area</i> <i>*Video classes are clear and understanding and easy to learn.</i> <i>*Video classes are convenient because we can revise easily and can be studied at home</i> <i>*Very useful for future learning .eg exams to recollect the sums</i> <i>*It is convenient and easy for learning, *The video is very useful and understandable</i> <i>* Video based self learning is useful to recall while having doubts during exam times</i> <i>*Video classes are best and convenient, * Yes mam it's convenient</i> <i>*Good & Easy To Understand, * It's very useful to learn from the videos</i> <i>* Easier to revise and recap, * It's very useful and help for exam preparation time</i> <i>It was better than regular classes * It helpful in future to reference the doubt</i> <i>*In videos we can able to pause the session and learn but in blackboard we can be attentive in class, * It's very useful to learn from the videos..also it is very useful to revise before exams. * Its is useful for future reference * Easy to understand and useful for future reference * Video class is useful to learn and it some thought we can pause the video and we can learn again * It is very useful to learn easily * It's easy way to understand * Easy to learn * Easy to understand * The video is useful both in the present and for future purposes. * Quickly understandable and also helpful for further reference.</i> <i>* We can able to listen again if we can't understand * Very useful for the exam time and can be understandable * Easy to understand* It is easy to understand * Easy to understand * Easy to understand * Useful to further reference * Easy to understand in videos * Yes.. useful future reference * It is useful * Highly beneficial for revising the concepts * Very beneficial</i> No Comments, Learning in mobile so we can't get clear clarification
II YR	I like regular classes more tha videos... videos for important problems will be very much useful. <i>*Good, * Yes it is useful for us to learn via video as we are able to clarify our doubts at any time. * It is easy to understand and has an advantage to pause or replay until we understand. It is also to revise during exam time. * It is very useful to clarify my doubts</i> <i>Good and it is very useful during my exam times * It is useful to revise for cat exams</i> <i>I can refer to the video before the exam * Nice and we could even revise during the exams * Videos is ok mam but in every method of sum one or two should practice in class mam * It is very useful in exam time to revise * My wish is it's convenient both</i> <i>*It's good * Videos are better than online class * It's useful in exam time to revise</i> <i>*It is useful for recollecting what was taught and if we have some doubt, at that time it is useful for us. * Easy to learning * Say this method is comfortable for me... If I have any doubt at that time I can</i>

	<i>see that and clear my doubts * This method is personally useful for me because during exam time i can recall with this videos * It's easy to revise during exams *Good</i> 20% ok Mam, couldn't concentrate more on the videos, we listened to the classes with full attention. <i>*Video classes is convenient than online classes but we also need regular class, so we can clarify our doubts * It is really useful as we can revise during exam times</i> <i>*It was helpful time of exam for revision * It is useful to read during exam time</i> <i>* It is very useful * Better to learn during exams * It is very useful</i> <i>* Good * Its good to study in videos * 7/10 * * Better than online class but not good than offline classes* It is very useful to clarify my doubts</i> I like regular classes more tha videos... videos for important problems will be very much useful.
I YR	<i>*The videos were easy to understand and much better than online classes</i> but i still miss the blackboard teaching <i>*It's really good * It is easy and comfortable to learn</i> No I think if you take classes in Blackboard we can understand the sums easier than the video It is very difficult to learn. <i>*Good *Good * In video-based learning we can see the video any number of times till we understand the particular concept so it's useful</i> The understanding won't be better than in offline or online classes No because I'm not able to understand the videos .it's better in regular classes <i>*8/10 * The video is very useful</i> Blackboard teaching is much more understandable <i>*It's useful to learn * Its good ...but not gave the same knowledge comparing to the offline classes</i> We can't gain that much knowledge from videos Offline classes are better to understand it is difficult to understand the subjects through videos I prefer offline classes than videos or online classes I feel that during regular classes I understand more clearly ma'am I don't have net .. that's the only point

Observation & Inference

From the above experiment we are able to draw the following inferences:

- There is no difference in the learning abilities between the 3 sections namely A, B, C of the same class. (based on Overall marks)
- There is no difference in performance between Video based Self-learners and Regular learners for Second and Third years in Accounts subjects - The video-based learning was done during class hours in the presence of the facilitator
- **The performance of First-year students exposed to Video-based Self-learning was nor on par with their peers under regular learning**

● **The performance of First-year students exposed to Video-based Self-learning has declined compared to their performance in the subject in the previous semester**

● For the First year students who were under Video based self-learning, only 50% of the lessons were done in the class. The rest of the videos were shared with students working at home. They did not have a facilitator confining them to learning for fixed hours for 50% of the topics covered.

● Based on the feedback, the majority of the students prefer video classes supported by a facilitator.

● The observations reveal that Video-based digital learning is effective in the presence of a facilitator. Students prefer regular classes, but like to be supplemented by digital resources.

Conclusive Remarks

This experiment was done to study and understand the students' response to digital learning engagement in the classrooms against regular blackboard teaching of problem papers (Commerce group) in arts and science colleges. The outcome of this experiment has provided the following insights to the experimenter.

● The study suggests that E-LEARNING USING DIGITAL/VIDEO-BASED methods are useful and helpful to the students.

● The performance of the students is affected by the PRESENCE/ ABSENCE OF A FACILITATOR TO ENGAGE THEM IN SELF E-LEARNING during the prescribed hours.

● Students prefer regular classes to be supplemented by digital resources

● Only sharing of video content, without proper engagement results in a decline in the performance of students.

From the above discussions, we understand that blended learning is a more appropriate method of teaching for students in Arts and Science Colleges.

From the student's perspective:

The advantages of self-based e-learning over blackboard-based teaching are learning at your own pace, learning at a convenient time and environment, replaying the session, revision, personal space, etc. The students have acknowledged these benefits.

The self-based e-learning is deficient in some aspects like a lack of personal contact with staff to clarify doubts immediately, peer learning is missing, and lack of clarity or depth in some areas. These have been identified by the students.

From the Staff Perspective

It takes a lot of time, effort and creativity to create and deliver the content in modules. It is a one-time process and only needs to be revised or customized whenever necessary.

The study indicates that the performance of the students declines if the sessions are not administered properly. Faculty Facilitation is a key factor in digital learning at UG level in arts & science colleges in sub urban areas because staff need to cater to different categories of learners.

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