Influence of Innovative Pedagogies and Evaluation Techniques on Post Graduate Students of S.S. Dempo College, Goa

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Abstract

The ultimate goal of any student taking up higher education is to become industry ready after their course is complete, or further their research capabilities in the area of education or corporate sector. Working in any industry is not devoid of problems, and unless teachers include innovative pedagogies through problem-based learning the students may find it difficult to solve problems in real life situations. This study focuses on pedagogies that integrate the knowledge of teaching methods, human and technological aspect. This can prove to be rewarding not only to the students but also to the teacher who imparts learning. Education has moved beyond classroom to some extent through the influence of technology; however this aspect which was initially rejected by most teachers, has succeeded in creation of the pull factor, through innovative models such as introduction of flipped classroom method, which is discussed in the literature review section along with spaced-learning method which follows three levels of inputs with breaks in between. Innovative pedagogies tend to be student centric than teacher centric, due to the student brain work involved by intelligent use of methods and technology. This study was conducted as a Quazi experimental design approach on two groups of post graduate students of n =14 in group A treated as a focus group and n =11 in group B treated as a control group. The results of the study have been discussed in detail in this paper.

Keywords: Pedagogies, Andragogies, Dimensions of Pedagogies, Evaluation and Feedback

Introduction

Innovative pedagogies are paramount to keep the students engaged and interested in a topic being taught. Various methods have been used to infuse learning and at the same time these experiments have been measured to arrive with the empirical data which can be analysed using the research methods. To attain an engaging lecture, it is important that the teacher goes beyond the approach of one way lecture, which was teacher centric and focused on completion of a syllabus to student centric approach, where the entire batch of students have to be actively involved in the session that lasts for one or two hours. This study examines the collaborative interaction of methods, humans and technology in a classroom setting, on creating a learning environment for students. It also aims at evaluating the performance of the students of the two groups considered under the Quazi experimental design, with and without the implementation of new pedagogies.

Purpose of the Study

This study has been conducted to identify if the innovative pedagogies have a significant influence on the perception, content knowledge and performance during evaluation of post graduate students of S.S Dempo College of Commerce and Economics.

Literature Review

The contemporary learning environment is created through the interaction of various dimensions. The review of literature tries to critically evaluate the interactions of these dimensions through the work of researchers in these areas.

Apart from following the pedagogies in education, the students of higher education are also adults and would need the andragogies to be introduced, adult

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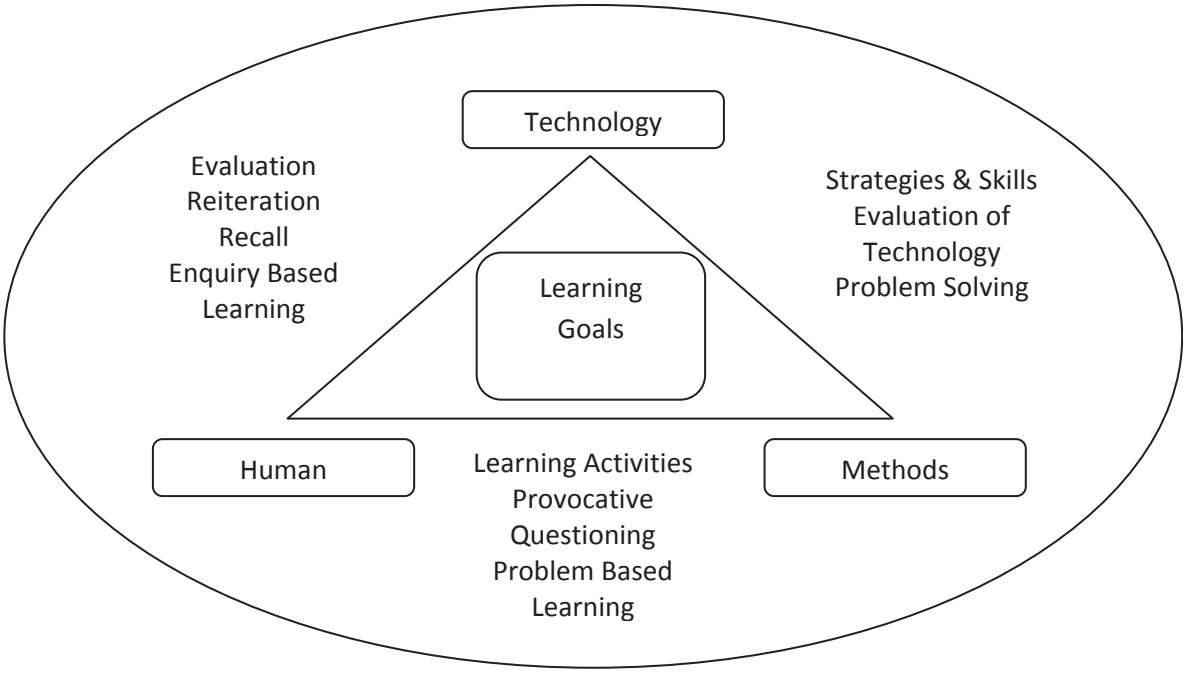

Figure 1: The Learning Environment and the Interactions of Three Dimensions
Source: Cheryl Venan Dias, 2014

learning techniques. Robert Gagne in his book 'The conditions of learning' published in 1965, his theory indicated that adults associate mental events to process their learning based on the stimuli being applied. His theory specifies nine different events that would require a different approach. These methods are now included in instructional methodologies and design, for both classroom and online education.

Kruse[7] Indicated that Gagne followed the behaviourist approach in learning. His theory covers the nine events as: Gain attention, Inform learner of objectives, Stimulate recall of prior learning, Present stimulus material, Provide learner guidance, Elicit performance, Provide feedback, Assess performance, and Enhance retention and transfer.

Corrigan[3] highlighted the practices of Fink et al. by listing a series of activities involved in teaching that includes course design, significant learning, active and collaborative learning, service learning, reflective writing, feedback, and research and assessment of teaching. He has also advocated that each practice requires the teacher to explain the key ideas with several paragraphs and list two to five resources for further reading.

By doing so the teacher reiterates the final step of Gagne's nine events which reinforces learning or enhances retention by providing additional research material to the student. It also aims as assessing teacher's skill level in delivering teaching. Hence the teacher becomes a learner as well.

Teaching and learning need to have a final outcome that is the learning goals[1], created the Bloom's Taxonomy to achieve learning goals through design induced curriculum. The aspects of Bloom's taxonomy appeared as a hierarchical model, touching upon Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation.

Apart from curriculum design this hierarchy can be introduced in creating instructive questioning techniques. Where the teacher can move away from the basic dichotomous "Yes" and "No" question - answer session to a more provocative questioning that stir

deeper understanding of the subject being taught. Bain (2004) advocated the use of provocative questions; Meyers and Jones[9] suggested that the questions should be relevant to the current topic being taught, thus inducing the aspect of relevancy from Gagnés nine events in Learning.

However, Fink[4] designed the Fink's Taxonomy of Significant Learning. Although like Bloom his model has six features and instead of being hierarchical they are more interactive in nature. The interactive aspects covered are: Learning How to Learn, Foundational Knowledge, Application, Integration, Human Dimension, and Caring. It appears that the only common features of both models are the levels indicated through knowledge and application. Fink's model is more oriented towards the human aspect of learning than the methodological learning system itself.

Okojie et.al.[12] (n.d.) deliberated on the integration of technology and pedagogies. In their attempt to describe the relationship between technology and pedagogy, they have stated that it is not limited to the mechanical application of hardware and software devices during the process of instruction, but it should include strategies for selecting new technologies and skill sets to demonstrate how the new technologies should be used, evaluated, and customised to solve problems in real life situations.

Savery[13] (2006) defined Problem-Based learning (PBL) as an instructional approach that enables learners to conduct research, integrate theory with practice; it stimulates them to apply their knowledge and skills to derive solutions to problems presented in a case study.

In the PBL method, the student is stimulated to build a solution as a mental schema, due to the ill-structured problems. This helps them to identify causes and possible solutions. This approach is student centric, the teacher is more of a moderator and facilitator, the problems help students to intersperse real life situations and scenarios (Barrows, 1996).

Problem-Based learning methodology brings the student closest to the real life situation that they would encounter while working. A new concept called authentic activity was introduced by Lebow. Lebow[8] described the concept of authentic activity as "experiences of personal relevance that permit learners to practice skills in environments similar to those in which the skills will be used." To add to this Newmann and Wehlage[10], described authentic activities as "Real world tasks that a person can expect to encounter on the job, in the home, or in other social contexts." Thus impressing the need for problem based learning to be used in a classroom setting.

Newmann, Marks and Gamoran[11] assert that many educators would associate the students' active construction of meaning, with their own experiences. While Collins, Brown and Newman[2] highlighted that in order to construct the meaning of a concept they would need to collaborate, and interact with one another it could be during a simulation or a classroom session. This will ensure that they can complete the authentic tasks for which the simulation was initially applied.

The aspect of collaboration is seen when a task such as group presentation is given to the students. They may not be in physical presence of each other; however the use of technology has made it feasible to collaborate using mobile, internet and applications that facilitate communication. It is essential that the students make an active effort to interact, this will help them to share their thoughts, share their ideas relevant to past experiences, collaborate with peers, and at the same time constructing their own meaning to the learning they are seeking while incorporating the perspectives of other students in class.

Zubizarretta[17] advocates the reflective learning method; this concept changes the learning gear into another dimension. Here the learner has to pause and reflect on the process of learning than on the act of learning. These are induced through minute papers expressed in one to three sentences, learning journals expressed in one to four paragraphs, and learning portfolio that aims to answer the three – What's, and one How of the learning process.

Spaced learning method (n.d.) was developed and introduced by Monkseaton High School, where the content is divided into sizable chunks with short

burst of physical activity. The process is: First input- presentation, break, Second input- recall, and presentation to fill in missing information, break, and Third input – Application. The learning method promoted here is enquiry based learning.

A successor to pre-read is Flipped Classroom Method, where in teacher uploads videos, video logs, and lecture notes into YouTube, the student has to view this video to make personal notes and return for the next session. The teacher gets sufficient time to apply learning, the student gets to synthesise their prior learning and construct new ideas and concepts. This learning method promotes off-class learning. Reinforcement can be done by also conducting an online evaluation. Gobry[6] suggests that this method addresses issues such as absenteeism, promotes easy recall of subjects, the students can learn at their own pace at home.

Online or e-learning has recently dominated the scene in the USA, where each student gets a voice as compared to the monopolised single student dominated class. This approach results in an engaged class[5].

Sharples et. al.[14] reported that Massive Open Online Course (MOOC) has seen a tremendous interest from universities and venture capital investors. It has been observed that around 20,000 learners register for MOOC with around 5-10% being able to reach the end point of the course. They are also of the opinion that such technology is not meant to replace formal education but intends to complement it.

The thorough literature review identifies the following knowledge gaps, when studied in detail will help the classroom sessions to become more innovative in its approach towards the students. Bloom's taxonomy addresses concerns such as provocative levels of questioning; Fink's approach is more inclined towards interactivity of the learning process and considering the human aspect during imparting education. Gagnés event emphasise easy recall by reinforcing learning, though Gagnés events are associated with nine different approaches, which also needs to be incorporated into teaching methodologies, which will enable the class to be more interactive in its approach. It is now possible that recall of a construct can be triggered by technology interventions. The upcoming trend is the use of MOOC's, while MOOC is not an end in itself. There could be various drawbacks with regards to lack of collaborative learning, discerning the teacher's accent as it is a multi-cultural environment, accessibility and comprehension depending on the level of intelligence and other intrinsic barriers present in the students. Integration of the human, technological and pedagogical interventions in a classroom can have the best results which need to be explored through the causal study.

Aims and Objectives

The objectives of this study are to:

1. List the pedagogies used in higher education.
2. Identify the perceptions of students about innovative pedagogies.
3. Identify how pedagogies influence the performance during subject evaluations.

Methodology & Design

This uses both exploratory method towards the innovative pedagogy as a unique construct by the process of literature review and causal research design approach on a batch of two groups of post graduate students were studied with n = 14 in Group A, and n = 11 in Group B.

Quazi experimental design was used to analyse the data as the groups cannot be randomised to be named as an Experimental design.

Group A: MA in Tourism and Heritage Management

Group B: PGDBA in Event Management

Subject Taught: Business Research Methods:

Duration of the experiment: June – September 2014.

Listing of Pedagogies Involved for Group A and Group B

Here the word treatment refers to innovative pedagogies applied for a particular group.

1. Treatment for Group B: (Control Group)

The control group had been exposed to the basic pedagogies such as:

a. Knowledge and Comprehension Based Pedagogy: Classroom lecture method, Pre-reads, and Vodcasts which were accessible in class.
b. Application and Analysis Based Pedagogy: Use of SPSS software, Online Evaluation.
c. Integration and Human Dimension Based Pedagogy: Brainstorming, Debates, Regular Presentations, Classroom interaction
d. Problem Based Learning: Case Analysis
e. Reflective writing

Advanced Pedagogies Abstained: Flipped classroom and Spaced Learning methods, PREP Method of presentation, 24/7 Method of presentation.

2. Treatment for Group A: (Focus Group)

The focus group had been exposed to all of the above sets of pedagogical approaches including:

a. Flipped Classroom Method: It involves compulsory video viewing before attending some of the practical intensive sessions.
b. Spaced Learning Method: Interactive short bursts of physical activity in a span of 20 minutes, Rhythmic breathing for 5 minutes.
c. Presentation by using PREP method: This includes a four minute presentation, where the topic is delivered using, point to paraphrase, reason for the discussion, real life example and points to summarise. The entire exercise is recorded and feedback provided to the students upon replay.
d. Presentation by using 24/7 method: Seven minutes of presentation, displaying 24 images only where as text is not used in the slides. Creates visual stimulation for viewers, and the delivery promotes auditory inputs from the presenters.

Steps Involved

Group A: Pre-test not conducted, Advanced Pedagogy introduced, Observations made and-recorded – Post Test Conducted (Evaluation)

Group B: Pre-test not conducted, Basic Pedagogy introduced, Observations made and recorded – Post Test Conducted (Evaluation)

Statistical Tests Used

- ANOVA for all three pedagogical dimensions for ranked perceptions
- Mann – Whitney U test for all three pedagogical dimensions on perceptions
- Chi-square test for evaluation techniques and feedback methods used
- t-test for evaluation of performance of both groups

Analysis of Data

Perceptions of Post Graduate Students from both Groups about the Pedagogies Used.

Hypothesis Statement:

H1: There will be a significant difference in perceptions about the pedagogies used between students of both groups.

Variables Under Test

Independent Variable: Pedagogies Used

a) Human Dimension
b) Teaching Method Dimension
c) Technology Dimension

Dependent Variable: Student Perceptions of the two groups

Influence of Innovative Pedagogies on Student Performance during Subject Evaluation.

Hypothesis Statement:

H2: There will be a significant influence of the evaluation technique on perceptions of the students.

H3: There will be a significant influence of the feedback system used on perceptions of the students.

Variables Under Test

Independent variable: Evaluation and Feedback Techniques

Dependent variable: Perceptions of students

Hypothesis Statement:

H4: The pedagogies will significantly influence the performance during subject evaluation.

Variables Under Test

1. Independent Variables : Group A and Group B treatments
2. Dependent Variable: Content Knowledge via performance

Descriptive Statistics:

Majority of the students opting for higher education fall under the age range of 21–25 with a percentage of 92%. A recent trend also shows that there are a higher number of female students enrolling for higher education than male students. Majority the students have a little or no work experience given their young age of entry into higher education represented by 92% followed by 8% represented by two students who have a work experience in the range of 2–3 years as indicated in table 1. The Quazi-experimental design used data from two groups of students with usable data of n = 14 students with a percentage of 56% from group A, followed by data from n = 11 students with a percentage of 44% from group B. As indicated in table 1, the total response was derived from a population of N = 25 students.

Perceptions about Pedagogies among Post Graduate Students.

The perceptions of the students were assessed using three dimensions, which had 18 questions each. The students of both group A and B were asked to rate and indicate the importance of each of 3 dimensions on a Lickert's scale of 1 to 5, (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree)

The mean ranks of the assessed perceptions are indicated in table 3.

The hypothesis was established for the test as:

H1: There will be a significant difference in perceptions about the pedagogies used between students of both groups. H_{a1}: There is no significant difference between the ranked perceptions of students. Analysis of Variation of the various dimension measured:

With a significant level of 0.000 having strong evidence against the null hypothesis for the human dimension as indicated in table 4a, the alternative hypothesis is accepted that H_{a1}: There is a significant difference between the ranked perceptions of students.

With a significant level of 0.000 having strong evidence against the null hypothesis for the Teaching Methods dimension as indicated in table 4b, the alternative hypothesis is accepted that H_{a1}: There is a significant difference between the ranked perceptions of students.

With a significant level of 0.000 having strong evidence against the null hypothesis for the Technology dimension as indicated in Table 4c, the

Table 1: Demographics of the Students who Participated in the Survey.

		Frequency				Total	Percentage
		A		B			
		Gender		Gender			
		Male	Female	Male	Female		
Variables		n = 14, 56%		n = 11,44%		N = 25	
Age Range	15–20	0	1	0	0	1	4%
	21–25	2	11	3	7	23	92%
	26–30	0	0	1	0	1	4%
Marital Status	Single	2	12	4	7	25	100%
	Married	0	0	0	0	0	0%
Experience	0–1	1	11	4	7	23	92%
	2–3	1	1	0	0	2	8%

Table 3: Mean Scores of the Three Dimensions

Dimensions	Rank	Mean Scores
Human	1	3.88
Technology	2	3.57
Teaching Methods	3	3.53

Table 4a: Human Dimension - ANOVA with Friedman's Test

		Sum of Squares	df	Mean Square	Friedman's Chi-Square	Sig
Between People		39.887	23	1.734		
Within People	Between Items	133.456[a]	17	7.850	134.574	.000
	Residual	271.155	391	.693		
	Total	404.611	408	.992		
Total		444.498	431	1.031		

Grand Mean = 3.88

a. Kendall's coefficient of concordance W = .300.

Table 4b: Teaching Methods - ANOVA with Friedman's Test

		Sum of Squares	df	Mean Square	Friedman's Chi-Square	Sig
Between People		39.541	22	1.797		
	Between Items	101.935[a]	17	5.996	94.087	.000
Within People	Residual	321.676	374	.860		
	Total	423.611	391	1.083		
Total		463.152	413	1.121		

Grand Mean = 3.53

a. Kendall's coefficient of concordance W = .220.

Table 4c: Technology Dimension - ANOVA with Friedman's Test

		Sum of Squares	df	Mean Square	Friedman's Chi-Square	Sig
Between People		53.502	24	2.229		
Within People	Between Items	80.791[a]	17	4.752	85.225	.000
	Residual	322.098	408	.789		
	Total	402.889	425	.948		
Total		456.391	449	1.016		

Grand Mean = 3.52

a. Kendall's coefficient of concordance W = .177.

Table 5: Mann-Whitney Test Statistics for Human Dimension.

Test Statistics[a]

	In a classroom setting you prefer to listen to new concepts, theories and constructs.	Brainstorming session brings your ideas out into the open.	Debates challenges you to speak better in class.	Brainstorming sessions gives everyone an equal opportunity to voice their opinion in the classroom.	Debates helps to get new ideas from other classmates.	In a classroom setting you prefer to take notes when lecture is delivered.	In a classroom setting you prefer to listen to examples from around the world and the latest in the news related to the current topic being discussed.	You feel challenged and charged to answer questions posed after a group presentation.	You feel there is ample time for intelligent interactions during the BRM sessions.	You feel that clarifications received for the questions will help to master the subject better.	In a classroom setting you prefer if the teacher illustrates a lecture that is being delivered.	In a classroom setting you prefer if the teacher delivers a lecture without any illustration.	You feel that your ideas are recognised during a brainstorming session.	You prefer to collaborate and provide inputs during the brainstorming sessions.	You feel that the teacher's input is important to help me reach my learning goals.	You prefer if the teacher specifies the learning objectives before class begins.	You prefer to view demonstrations done by the teacher before working on a new application.	You prefer to present in a group than doing it individually.
Mann-Whitney U	26.000	23.000	44.500	34.000	22.000	44.000	34.500	35.000	36.500	17.000	44.500	42.000	35.500	30.000	38.500	42.000	31.000	8.000
Wilcoxon W	81.000	78.000	99.500	89.000	67.000	89.000	79.500	80.000	81.500	62.000	89.500	97.000	90.500	85.000	93.500	87.000	76.000	63.000
Z	-1.930	-1.922	-.044	-.951	-2.114	-.087	-1.212	-.872	-.391	-2.566	-.044	-.259	-.946	-1.381	-.603	-.262	-1.233	-3.117
Asymp. Sig. (2-tailed)	.067	.055	.965	.341	.035	.931	.225	.383	.696	.010	.965	.795	.344	.167	.547	.793	.218	.002
Exact Sig. [2*(1-tailed Sig.)]	.133[b]	.079[b]	.968[b]	.400[b]	.065[b]	.968[b]	.400[b]	.447[b]	.730[b]	.022[b]	.968[b]	.842[b]	.447[b]	.243[b]	.604[b]	.842[b]	.278[b]	.001[b]

a. Grouping Variable: Group Mem

b. Not corrected for ties.

Table 6: Mann-Whitney Test Statistic for Teaching Methods Dimension

Test Statistics[a]

	Case Analysis gives you opportunity to identify problems that could occur in the industry.	Short breaks with physical activity really energises you for the next topic.	You feel that PREEP method helps to manage your time better.	You feel self conscious while presenting.	Some questions asked in a case analysis make you think deeper about a concept and construct.	Having short breaks rejuvenates you and helps to retain the subject better.	Debates should be a must in every classroom session.	You feel that PREEP method helps to structure your presentations better.	You feel the pre-reads to be needs to be replaced with something dynamic such as a video.	You find it difficult to structure the presentations	You find it difficult to voice your opinion during a debate.	You find that presentation brings out your best.	You find the pre-reads are time consuming as there are a lot of activities slated out and other projects to complete.	You freak out (Panic) during a debate.	You freak out (Panic) while making a presentation.	You prefer the case analysis method as it helps to apply the learning in real life problems.	You prefer the PREEP method as it does not consume a lot of time.	You prefer to read the hand-outs that are given before attending the next lecture.
Mann-Whitney U	44.500	29.000	25.000	22.500	37.500	37.000	35.500	13.500	44.000	40.000	44.000	26.000	40.000	27.000	24.000	38.500	22.500	20.500
Wilcoxon W	99.500	84.000	70.000	67.500	82.500	92.000	80.500	58.500	89.000	95.000	89.000	71.000	95.000	72.000	69.000	83.500	67.500	65.500
Z	-.044	-1.424	-1.902	-1.994	-.695	-.810	-.472	-2.909	-.087	-.430	-.087	-1.418	-.432	-1.540	-1.774	-.570	-2.167	-2.090
Asymp. Sig. (2-tailed)	.965	.155	.057	.046	.487	.418	.637	.004	.930	.667	.931	.156	.665	.124	.076	.569	.030	.037
Exact Sig. [2*(1-tailed Sig.)]	.968[b]	.211[b]	.113[b]	.065[b]	.549[b]	.549[b]	.666[b]	.008[b]	.968[b]	.720[b]	.968[b]	.222[b]	.720[b]	.156[b]	.095[b]	.604[b]	.065[b]	.043[b]

a. Grouping Variable: Group Mem

b. Not corrected for ties.

Table 7: Mann-Whitney Test Statistic for Technology Dimension

Test Statistics[a]

	You feel confident about your performance, when a video is taken during the presentation.	You can always refer to the video recording to evaluate the topic.	You feel that 247 is a new method of presentation.	You feel that 247 helps to structure your presentations better.	You feel conscious if your video is taken during the group presentation.	You appreciate the way feedback is given after answering an online evaluation.	You feel that the quality of the video has to be good for an effective learning experience.	Downloading videos is a challenge, and you prefer ones which have been predownloaded.	You feel that the neutral accent of the presenters in the video is very important.	You feel that videos and presentations stimulate your thinking process.	You feel the presenters who have a neutral accent in a video will create a better learning experience..	You like to review the presentation made through the recorded video.	You prefer to download the power-point presentation instead of taking notes.	You prefer to have a feedback based on the video performance.	You prefer to view the videos on a particular session before a new concept is discussed.	You prefer to work on SPSS to analyse the statistical data.	You feel that PSPP s a better alternative to SPSS for students.	You feel that only theoritical aspect in learning SPSS software is insufficient.
Mann-Whitney U	17.000	38.000	22.500	18.000	40.500	40.000	22.000	39.500	44.500	30.000	42.000	25.500	38.000	3.500	40.500	31.500	36.000	36.000
Wilcoxon W	62.000	83.000	67.500	63.000	95.500	85.000	77.000	94.500	89.500	75.000	97.000	70.500	93.000	48.500	85.500	76.500	81.000	91.000
Z	-2.379	-.611	-2.387	-2.707	-.385	-.441	-2.197	-.477	-.044	-1.329	-.260	-1.730	-.593	-3.688	-.427	-1.426	-1.378	-1.378
Asymp. Sig. (2-tailed)	.017	.541	.017	.007	.700	.659	.028	.633	.965	.184	.795	.084	.553	.000	.669	.154	.168	.168
Exact Sig. [2*(1-tailed Sig.)]	.022[b]	.604[b]	.065[b]	.029[b]	.720[b]	.720[b]	.065[b]	.661[b]	.966[b]	.243[b]	.842[b]	.113[b]	.604[b]	.000[b]	.720[b]	.278[b]	.497[b]	.497[b]

a. Grouping Variable: Group Mem

b. Not corrected for ties.

alternative hypothesis is accepted that H_{a1}: There is a significant difference between the ranked perceptions of students.

Of the 18 variables tested under the Human Dimension, it is observed that three factors indicated significant differences, where $p < 0.05$, Debates helps to get new ideas from other classmates, Preference to present in a group than presenting individually at 0.002[1], and You feel that clarifications received for the questions will help to master the subject better is calculated as 0.010. Here we reject the null hypothesis and accept the alternative hypothesis H_{a1} (a): There will be significant difference in the perceptions of students about the three pedagogies related to Human Dimension.

The 18 variables tested here, It is observed that the statements: You feel self conscious while presenting, You feel that PREP method helps to structure your presentations better, You prefer the PREP method as it does not consume a lot of time, and You prefer to read the hand-outs that are given before attending the next lecture shows significant difference, where $p < 0.05$ at 0.046, 0.004, 0.030, and 0.037 at 2-tailed significance respectively. The null hypothesis is rejected for these four statements and alternative hypothesis is accepted. H_{a1} (b): There will be significant difference in the perceptions of students about the four pedagogies related to the Teaching Methods Dimension.

As for the technology dimension, it is observed that the statements: You feel confident about your performance when a video is taken during the session, You feel that 24/7 is a new method of presentation, You feel that 24/7 helps to structure your presentations better, Quality of the video has to be better, preference of a feedback based on video performance. Where $p < 0.05$ at 0.017, 0.017, 0.007 and 0.000 respectively, there by accepting the alternative hypothesis, H_{a1}(c): There will be significant difference in the perceptions of students about the four pedagogies related to Technology Dimension.

The students of both groups have indicated that they prefer answering their class assessment online with a mean of 3.68, followed by paper method with a mean of 3.44. They also feel that discussion after an assessment helps to identify learning gaps with a mean of 4.12, followed by preference to discuss the question paper after completing the assessment has a mean of 3.33.

Table 8a: Descriptive Statistics on Evaluation and Feedback

	N	Mean	Std. Deviation	Minimum	Maximum
Discussion after an assessment helps to identify learning gaps.	25	4.12	.881	1	5
You prefer answering the class assessment online using googledocs - forms.	25	3.68	1.108	1	5
You prefer the paper method of writing assessments.	25	3.44	.917	1	5
You prefer to discuss the question paper after completing the assessment.	25	3.36	1.287	1	5

[1]For analysing the p values Asymp. Sig (2-tailed) was used for Table 5, 6 and 7.

Table 8b: Chi-Square Test Statistics

	Discussion after an assessment helps to identify learning gaps.	You prefer answering the class assessment online using googledocs - forms.	You prefer the paper method of writing assessments .	You prefer to discuss the question paper after completing the assessment.
Chi-Square	17.400[a]	4.600[a]	15.800[a]	3.600[b]
df	3	3	3	4
Asymp. Sig.	.001	.204	.001	.463

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 6.3.

b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 5.0.

A Chi-square test was conducted evaluation techniques and feedback methods used. We accept the null hypothesis for the variable that the students prefer to discuss the question paper after completing the assessment and for the evaluation technique of using online test.

As evaluation was done using the paper method and online method, while the null hypothesis can be rejected for the paper method, we accept the alternative hypothesis

H_{a1}: There is a significant difference in the perceptions of students towards the paper method of writing assessment.

While the null hypothesis is rejected for the evaluation technique regarding preference on discussion after the assessment to identify the knowledge gaps, we accept the alternative hypothesis.

H_{a3}: There is a significant difference in the perception of students towards feedback method with regards to the discussion after an assessment to identify knowledge gaps.

The sample size of each group was below 30 so it was appropriate to use the t-test for this case. The descriptive statistics derived from the independent t-test indicates that the mean scores of Group A is 15.142,with a standard deviation of 1.92 compared with Group B with mean scores of 13.1818 with a higher standard deviation of 2.70.

Two-tailed $p < 0.05$, df is 23 = 0.04510708 which is significant.

The results of the two groups, after being analysed under the t-test for significance. We can reject the null hypothesis of there is no significant influence of pedagogical methods on the student performance

Table 9: t-test for Evaluation of an Online Test.

Independent t-test		
	Group A	Group B
Mean	15.1428571	13.1818182
SD	1.92582222	2.70437356
N	14	11

Table 10: Equal Variance Analysis

p of F-Max--> Equal Variance	0.25058407
Mean diff.	1.96103896
SE	0.92547945
t-value	2.11894383
Df	23
two-tailed p	0.04510708

evaluated, and accept the alternative hypothesis. H_{a4}: There is a significant influence of pedagogical methods on the student performance evaluated.

Results and Discussion

The aspects that were examined under this study included the three dimensions related to pedagogy, and their interaction in a learning environment. The treatment given to Group A, differed with relation to the advanced pedagogies applied during their classroom session, in comparison with the control group B, where basic pedagogies were used. It was observed that there were significant differences in the perceptions of both the groups with regards to the pedagogies applied. Eighteen questions were asked to measure the perception towards each dimension and the control group responded with a neutral response of 3 on the lickert scale, for the advanced level pedagogies that were applied in their classroom. It was interesting to observe that they also inquired about these pedagogies after answering their survey.

The result from the ANOVA for each dimension indicated that there was a significant difference in the perception of dimensions among students.

The Mann-Whitney U test for Human dimension indicated that three aspects had a significant difference in perceptions, and were related to: Debates helps to get new ideas from other classmates, Preference to present in a group than presenting individually, and You feel that clarifications received for the questions will help to master the subject better.

While for the Teaching Methodology dimension, it is observed that the variables that had a significant difference in perceptions were: You feel self conscious while presenting, You feel that PREP method helps to structure your presentations better, You prefer the PREP method as it does not consume a lot of time, and You prefer to read the hand-outs that are given before attending the next lecture.

In the Technology dimension the variables: You feel confident about your performance when a video is taken during the session, You feel that 24/7 is a new method of presentation, You feel that 24/7 helps to structure your presentations better, Quality of the video has to be better, preference of a feedback based on video performance displayed a significant difference in perception.

It is indicative that most of the advanced pedagogies were abstained from the Group B, which has resulted in the difference in perception of both groups.

After administering the three dimensions of pedagogies, and especially advanced pedagogies for the group A, also the flipped classroom method was introduced, where they were asked to view the video before taking part in a classroom session, which was followed by evaluation of both groups. This experiment indicated that the Group A was strong on the constructivist aspect of the concept, and were able to grasp more in class compared to Group B which was exposed to the concept only in a classroom session.

This ascertains the need for reinforcement also a change in the manner in which pre-reads that are given, which should also include multimedia and videos for the student to refer before they attend the next session.

The significance levence F-Max is $p > .05$, which the level indicated at 0.2505 which is not significant, therefore equal variance was used instead of unequal variance even though the group sizes differed. The independent variable here was the Groups i.e. Group A and Group B, while their individual scores were the dependent variable, the treatment was the advanced pedagogies for Group A, and basic pedagogies for Group B. The results of the t-test for the equal variance independent t-test indicated a significant level under the two-tailed p-value at $p = 0.045$ which is $p < 0.05$, we can confidently say that the means of both the groups are different, indicating a strong evidence against the null hypothesis and accepting the alternative hypothesis that there is a significant influence of pedagogies on the performance evaluated.

Conclusion

In conclusion, this study would like to highlight that there are three dimensions interacting at various levels during a classroom session, some of the dimensions have a wider impact and reach in terms of technology, which can become a boon for

teachers if applied appropriately, it can help bridge the knowledge gaps for students. This study also observed that the major differences in perceptions of students under the Quazi experimental group were due to technology based factor and the way they interacted with it, including their use in feedback and evaluation, they were used both in class room to visually stimulate the students and also to reinforce learning outside the classroom session. They always have a takeaway when teachers associate technology with the learning. The Human dimension also indicated that the students had differing perceptions about collaboration, and discussions. While the Teaching Methodology dimension, indicated that the students had differing perception of the methods that were used. The descriptive statistics indicated the students agreed unanimously to discuss the questions after an evaluation to identify their gaps in knowledge, while the students also indicated that online methods of evaluation had a greater acceptance as compared to the paper method of evaluation.

It is also important that new pedagogies be tried by every teacher, and also the teacher needs to be in sync with the class with regards to the ease of use of technology by students, and also make best use of the existing gadgets that the student use to make it an interactive session this makes the classroom session to go beyond the confinement of four walls that traditional methods often rely on.

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