

Article

Comparative Study of the Teaching and Learning Techniques used in Technical and Professional Courses in Private and Government Universities/ Institutions

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The changing context of higher education necessitates the evolutionary step to impart knowledge and skills relevant and essential to prepare the students for future course of action. Innovative teaching learning practices are needed in order to meet the demands of the current knowledge age and to develop skills needed to succeed in live and the workplace in 21st century. The purpose is to make the exercise of teaching and learning more enjoyable and satisfactory. The paper specifically compares the teaching learning methods, learning styles and innovative techniques applied in private and government professional and technical universities and institutions. Descriptive exploratory survey design was employed in the present study to answer the research questions. The study was carried out in Private and Government Universities and Institutes of Higher Education, selected region wise from eleven districts of Punjab, and also from the Union Territory of Chandigarh. There were a total of 174 teachers and 1058 students who provided data for the study. The findings of the present study revealed that techniques applied in teaching and learning as reported by students refer to: team based techniques; and technology based techniques. The data reflect that the students of Private Universities depend more on teacher based learning, and the government University students depend more on self-learning. Innovative teaching activities being used by 28.23% Private, and 43.33% Government teachers refer to MOOCs, project competition, flipped classroom, and VAK (Visual Audio Kinaesthetic) style of learning.

Keywords: Methods and techniques, learning styles and innovative practices, Higher education

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Introduction

Throughout the world, though higher education is growing at a rapid rate, it is constantly under pressure to cater to the needs of the society due to: explosion of knowledge, information and communication; population explosion; aspirations of the youth and focus on capacity building. This calls for continuous upgradation of the skills for global interdependence, which necessitates learning throughout life. In view of the huge demand for higher education from all the strata of society, there are other pressures that are causing concern with respect to: accessibility, equity, quality and resources, as enumerated by Sudarshan and Subramanyan (2012). It has necessitated learning throughout life for human development and economic growth. The changing landscape of higher education is placing more pressure on universities and institutions to think differently in order to deliver more efficient graduates who are able to thrive in that evolving landscape and need to depart from ideas of yesterday. Use of the team based techniques of teaching and learning, which are appropriate in the technical and professional fields are helpful to increase the work efficiency and productivity of the students.

The higher education system have to face a great variety of challenges due to rapid advancement. Therefore, rigorous training of individuals is required in interdisciplinary field (Anderson, 2012). Higher levels of disciplinary and other contextual expertise is required in university teaching as it is a scholarly activity that draws on extensive professional skills and practices. In order to ensure quality, a shared understanding is required for an effective university teacher (Devlin, & Samarawickrema, 2010). Accordingly to Eggen & Kauchak (2006), teaching strategies can be applied in a variety of content areas to meet a different types of learning objectives. For example questioning, organising lessons, providing feedback, starting lessons with a review and ending with closure, applicable in all teaching situations. These strategies can be applied across instructional settings. Effective university teaching requires a particular set of skills and practices in accordance with requirements (Penny, 2003; Devlin, 2007c).

In the traditional system, teaching methods were teacher-centred without taking into consideration the students' needs and interests. This requires change in instruction in which their needs of students are considered that results in change in behaviour (Dooge, 2007). Moreover, a large number of graduated students especially bachelor holders do not feel ready enough to work in their related fields (Yash Pal, 2009). Further, Devlin, (2007c) states that in order to cater to student diversity, effective teaching must be able to manage and address such diversity which arises due to the massification and the internationalisation of Australian higher education. A wider range of both learning styles and preferences and a wider range of language, cultural and educational backgrounds are required to engage all students.

Review of Related Literature

Several studies have found that just one teaching model cannot effectively promote learning, but a combination of various teaching methods together will lead to more effective learning (Danaei, Zarshenas, Oshagh, Khoda, 2010).

Certain teaching-learning methods, such as problem based learning, are more effective than traditional methods i.e. lectures (Michel, Bischoff, & Jakobs, 2002). Devi and Deedi (2015) found students in research study preferred more teacher-centred teaching and learning approach, lecture teaching and learning method and small group teaching and learning. Mismatch between learning styles and teaching may affect the learning on the part of the students (Minotti, 2005). Making learning processes more flexible and encouraging the students to reflect on the way they understand and learn tasks that facilitate integration of information and skills from different fields (Knapper, 2008). More practical methods of teaching are required to improve the quality of education (Liu & lu, 2018). Prince and Felder (2006) found inductive methods to be more effective than deductive methods for achieving a broad range of learning outcomes which emphasises application of knowledge.

An attempt was made by the investigators to study the previous research studies in the area and could identify that a study was carried out over several issues pertaining to the connection between the competency of the teachers in their subject (Hussain, 2010) and teachers' awareness about modern pedagogy of teaching technology (Joshi, 2014). Studies were focused on the competency of the teachers at high school level and its impact on the students. Studies were conducted to analyse the depth of awareness of the teacher educators regarding IT-based teaching strategies and competencies of teachers of B.Ed. colleges (Watkar, 2014). It was also found in study that teacher effectiveness can be enhanced in e-learning environment. (Kumar & Kumar, 2010).

McKeachie (2006) cite numerous studies indicating that the lecture is found to be effective method as any other method in communicating factual knowledge. On the basis of other benchmarks like attitude change, thinking and problem solving skills, transfer of knowledge to new situations, student satisfaction with the course, motivation for further learning and post-course retention of knowledge - the lecture methods was not effective as compared to student active methods such as discussion.

By reviewing the studies, the investigator was able to make out that no studies were conducted on the assessment and comparison of methods and techniques applied in teaching and learning strategies used by the higher education teachers in private and Government universities/ Institutions. Realizing the fact that the innovative teaching strategies would definitely strengthen the teaching learning process, study was conducted in Professional and technical institutions/universities of Punjab.

Objective of study:

- (i) To assess and compare methods and techniques applied in teaching and learning used in Private and Government Institutions and Universities.
- (ii) To assess and compare the styles of learning, advantages of preferred style of learning used in Private and Government Institutions and Universities.
- (iii) To assess and compare the activities that foster innovative practices evolved in teaching and learning used in Private and Government Institutions and Universities.

Method and Instruments

In the present study the sampling technique used was both incidental and purposive in nature. It comprised of all those students present in the classes in the subjects concerned, and were taken as such at the time of data collection.

Field of Investigation

The study was carried out in Private and Government Universities and Institutes of Higher Education, selected region wise from eleven districts of Punjab, and also from the Union Territory of Chandigarh. Amritsar, Gurdaspur, Hoshiarpur, Patiala, Ropar, Mohali, Ludhiana, Fatehgarh Sahib, Jalandhar, Kapurthala, Nawanshahr and Chandigarh.

Sampling Framework**Sample size of the Teachers:**

It comprised a total of 174 teachers: 94 teachers from Private and 80 teachers from Government Universities who formed the sample for the present study.

Sample of the Students

There were a total of 1058 final year students taken from 594 from Private, and 464 from Government Universities, representing the field of Management, Pharmacy, Architecture, and ICT and Engineering.

The data collected from the Teachers and students mainly involved interactive/interview sessions held individually with them.

Brief Description of Data Gathering Instruments Used for Collection of Data**Questionnaire-cum-Interview Schedules for Teachers**

For conducting interviews, appropriate questionnaire-cum-Interview for teachers were prepared for each of the concerned personnel. Keeping in view the role and responsibilities of the teachers, the questions addressed to them relate to innovation in teaching/learning practices. The focus of interaction with the regular classroom teacher was to assess

For the validation of the tools, a preliminary survey was conducted in a neighbouring University which provided insight to modify the statements and questions according to the suggestions made by the respondents.

Questionnaire for Students

It deals with their expectation and satisfaction regarding qualitative aspects of the curriculum, teaching-learning and evaluation, preparation for life, and overall development of their personality. The questions centred round teaching-learning practices and the styles of learning, advantages of preferred style of learning.

Techniques used for analysis of Data

The entire data obtained from the three sources viz the teachers, and the students, required simple analysis of finding percentages of the responses elicited from the respondents.

Results and Discussion

The main purpose of teaching is to impart knowledge and skills relevant and essential to prepare the students for future course of action. The quality of teaching not only depends on the teachers pedagogical skills but also on learning environment catering to needs of students. Innovate technologies have entered the classroom, thus calls for modifying the nature of the interactions between students and professors which requires emphatic attitude for students and passion for learning.

Process of Teaching and Learning

Year after year, graduates of Institutes of Higher Education, be it technical or professional, fail to seek employment primarily because they lack professional attributes and technical competencies. The skills required in global market as **professionals** refer to:

- Aptitude for project management.
- Interpersonal skills, to work in team.
- Communication skills.
- Integrity: professional ethics.
- Sincerity of purpose.

Along with professional competencies, **technical competency** is required too, which refers to:

- Technical knowledge and understanding.
- Exposure to industry.
- Innovations.

In general, students lack practical knowledge and understanding to equip themselves with

professional and technical skills. The need is of proficient teachers and learners' initiative to accomplish the tasks and achieve the targets. It refers to the modalities of teaching and learning.

The teaching-learning modalities are: teacher centred, and learner centred.

The learner centred teaching techniques are: participative learning, experiential learning, collaborative learning that facilitate process of construction of knowledge. More recently digital resources of learning are more individualised, creative and dynamic. Quality of learning depends on teachers' readiness and initiative to make use of the available technology to enhance the process of teaching and learning.

It will be pertinent to differentiate between Method and Technique.

Method is the process: regular and systematic way of doing something to accomplish the task by series of related acts performed by the teacher. technique is the practical aspect of given task i.e. concretization of method of teaching. It is one of the manifestations of method.

Since the traditional methods i.e. teacher centred techniques are gradually being supplemented by group work, student centred and technology based individualised learning, an attempt was made to find out to what extent new techniques of teaching and learning have made inroads in professional and technical education.

Accordingly the students were asked to mark: apart from routine classroom teaching, which of the following techniques are applied in their subject.

The responses relating to techniques of learning and teaching are recorded in table 1:.

Table 1
Methods and Techniques of Teaching and Learning

Techniques of Teaching and Learning	Private		Government		Total		t-value
	N	%	N	%	N	%	
Team based							
Problem centred	320	53.87	146	31.46	466	44.04	4.98*
Project based	382	64.31	224	48.28	606	57.28	4.15*
Cooperative learning	259	43.60	125	26.94	384	36.29	5.26*
Brain Storming	168	28.28	65	14.01	233	22.02	6.26*
Technology based							
Online learning	218	36.70	111	23.92	329	31.10	5.46*
Flipped classroom	45	7.58	40	8.62	85	8.03	5.90*
Web conference based interactive tutorials	143	24.07	72	15.52	215	20.32	5.89*
Special expert sessions	342	57.57	159	34.27	501	47.35	4.79*
Tactical method: Industrial visits	391	65.82	216	46.55	607	57.37	4.17*

Source: IDC Survey Data 2018.

Note: Responses under Private Institutes are out of 594, and under Government Institutes are out of 464. Total responses are out of 1058 students.

- (1) The entries in the first column of the table relate to the techniques of teaching and learning being used.
- (2) The Number (N) and Percentages (%) in the table represent the application of each of the technique in teaching-learning being used out of the total sample in each row i.e. out of a sample of 594 for Private, and 464 for Government University students.

* significant at 0.01 level, $t=2.58$

Team based Methods and Techniques of Learning and Teaching: These are:

Problem based learning: It is applied in 320 (53.87%), Private and 146 (31.46%) Government Universities, making it a total of 466 (44.04%) responses of students (t-value is significant at 0.01 level)

Project based learning: It is mentioned by 382 (64.31%) Private, and 224 (48.28%) Government University students. In all it comes to 606 (57.28%) students who mentioned about this technique being used in their classroom (t-value is significant at 0.01 level).

Cooperative learning is being applied as per 259 (43.60%); Private and 125 (26.94%) Government University students. In all it comes to 384 (36.29%) responses (t-value is significant at 0.01 level).

Brain storming is being used according to 168 (28.28%) Private and 65 (14.01%) Government University students. In all it comes to 233 (22.02%)(t-value is significant at 0.01 level).

Technology based Techniques of Teaching and Learning:

Online learning: It is applied by 45 (7.58%) Private and, 40 (8.62%) students in Government Universities, which comes to a total of 85 (8.03%) classrooms where this technique is used.

Flipped classroom: This technique is mentioned by 45 (7.58%) Private, and 40 (8.62%) students from Government University students which comes to a total of 85 (8.03%) (t-value is significant at 0.01 level).

Web conference based interactive tutorials is another new technique being applied in teaching and learning according to 143 (24.07%) in Private; and 72 (15.52%) students in Government Universities. In all it is applied in 215 (20.32%) in the Universities (t-value is significant at 0.01 level).

Tactical method: Industrial training and visits: Tactical method focuses on practical implementation of acquired training.. It provides students with an opportunity to learn practically over and above the theoretical concepts . It is skilful to use available means to achieve an objective. Tactical enables students to understand actual work environment which is not possible in lectures. It enhances interpersonal skills and communication.

Teaching and Learning: Styles of Learning

Objective: To assess the styles of learning, advantages of preferred style of learning.

In the realm of teaching and learning, as the teachers have their own preferred style of teaching, the students evolve their own style of learning. In case of students either they depend more on self or on the teacher to acquire knowledge and skills.

Students were asked about their preference of learning whether self or teacher based learning, they responded to the question as listed in the table: 2.

Table 2
Students' Preferred Style of Learning

Preference	Private		Government		Total		t-value
	N	%	N	%	N	%	
Self learning	196	33.0	197	42.46	393	37.14	4.89*
Teacher based	279	46.96	200	43.10	479	45.27	4.62*
Both	119	20.03	67	14.14	186	17.58	6.42*
Total	594	100.00	464	100.00	1058	99.99	

Source: IDC Survey Data 2018.

* significant at 0.01 level, $t=2.58$

Self-learning: 196 (33%) Private, and 197 (42.46%) students from Government Universities prefer to learn on their own. Combined together 37.14% sample of students expressed their preference to self-learning (t-value is significant at 0.01 level). **Teacher-based learning:** In Indian conditions dependence on teachers is more because of teacher-centred classrooms. So 238 (40.07%) Private, and 137 (29.52%) Government Universities students depend more on teachers' guidance to learn and perform the task. It comes to a total 35.44% population of students who prefer teacher-based learning (t-value is significant at 0.01 level). **Both:** It is a combination of self-learning and teacher-based learning. In case of 119 (20.3%) students from Private, and 67 (14.14%) of Government Universities, their style/preference of learning is a combination of both self and teacher-based learning. May be it is more enriching to acquire knowledge and skills relevant to their curricular programmes (t-value is significant at 0.01 level).

Fostering Innovative Practices in Teaching

Objective: To assess the activities that foster innovative practices evolved in teaching and learning:

Out of 94 Private teachers, 85 of them, and out of 80, 60 of Government University teachers whose ideas are appreciated by the authorities were further asked to enumerate activities that foster innovative practices in teaching. Their responses have been recorded in table: 3 to follow.

Table 3
Activities to Foster Innovative Practices in Teaching

Response	Private		Government		Total		t-value
	N	%	N	%	N	%	
Innovative Teaching Activities	24	40.68	26	53.06	50	46.29	0.184
Outside exposure of students	19	32.20	14	28.57	33	30.56	0.312
Research	16	27.12	9	18.37	25	23.15	5.62*

* Source: IDC Survey Data 2018.

*significant at 0.01 level, $t=2.58$

Innovative Teaching Activities: According to the teachers refer to:

- Flipped classroom practice
- Visual Audio Kinesthetic (VAK) style of teaching visual aids
- NPTEL: National Programme on Technology Enhanced Learning
- MOOCs: Massive Open Online Courses
- Innovative Project Competitions and Project based Evaluation
- Animated Videos, Group Discussions
- Peer-to-peer teaching and learning

Such activities were carried out by 24 (28.23%) Private; and 26 (43.33%) Government University teachers.

Outside Exposure of Students refers to:

- Industrial visits
- Workshop/Conferences/Seminars
- Expert talks
- Power Point Presentation
- Online lectures

Regarding Outside Exposure of Students, 19 (22.35%) teachers from Private; and 14 (28.33%) teachers from Government University set up, used these practices in their day-to-day academic activities.

Research Activities as mentioned by teachers centre round:

- Updating of lectures through published research work in their discipline

- Student involvement in research projects
- Inclusion of industrial research in their assignments
- Case studies to make students realize their hidden potentials
- Implementing innovative ideas, and encouraging them to think out of the box
- Consultancy projects in research
- Patent filing

These activities were mentioned by 16 (18.82%) Private; and 9 (15%) Government University teachers (t-value is significant at 0.01 level).

In all the relevant responses came from 108, out of 145 teachers.

Discussion of results

In Private Universities, Team-based learning, problem centred project based and cooperative learning techniques are being applied in 43.60% to 64.41% courses in comparison to 26.94% to 48.28% responses of Government University students. Special expert sessions and tactical methods being used in 57.57%, 65.82% in Private, and 34.27% and 46.55% in Government Universities. In Private Universities, 40.07% students were in favour of teacher based learning; 42.46% students from Government Universities preferred self-learning. There were 20.03% students from Private Universities who preferred both teacher as well as self-learning. Innovative teaching activities were mentioned by 34.38% teachers. Outside exposure of students was the response of 22.76% teachers. Research to enrich learning techniques was reported by 17.24% teachers. Government University teachers were in a better position to elaborate the techniques that foster innovative practices in teaching.

Conclusions

Techniques applied in Teaching and Learning as reported by students refer to: team based techniques; and technology based techniques. Team based techniques are problem centred, project based; cooperative learning and brainstorming. These techniques are being applied according to 28.28% to 64.31% students of Private Universities; and 14.01% to 48.28% by Government University students. Technology based techniques of teaching and learning as mentioned by students are: online learning; flipped class-rooms, web conference based interactive tutorials. These techniques are being used by 7.58% to 36.70% teachers in Private Universities; and from 8.62% to 23.92% in Government Universities according to the responses of the students. It appears that application of team based and technology based techniques are more in vogue in Private Universities, as reflected in the responses of the students. Styles of Learning vary from student to student. The data reflect that the students of Private Universities depend more on teacher based learning, and the government University students depend more on self-learning.

Educational Implications

The innovative methods used by the teachers develop competencies among the students, which reflect quality in terms of adequately educated, highly satisfied, and employable graduates. The purpose is to make the exercise of teaching and learning more enjoyable and satisfactory. The process of producing employable graduates spans entire educational spectrum that will allow graduates to adapt to a rapidly changing and diverse world of work emphasising on adequate skills and competencies of graduates. In general, students lack practical knowledge and understanding to equip themselves with professional and technical skills. The need is of proficient teachers and learners' initiative to accomplish the tasks and achieve the targets. It refers to the modalities of teaching and learning. In designing the curriculum, the need of the day is to:

- Focus more on practical knowledge, hand on experience; industrial visits, and industry linked internship programme. These are essential inputs to ensure quality in technical education.
- In view of the limited opportunities to be employable in global market, there is need to strengthen the connection between skills and aptitudes of the graduates, with that of the requirements of the industry.

The institutions need to provide maximum opportunities to choose electives from diversified options to meet their objectives. More recently digital resources of learning are more individualised, creative and dynamic. Quality of learning depends on teachers' readiness and initiative to make use of the available technology to enhance the process of teaching and learning.

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