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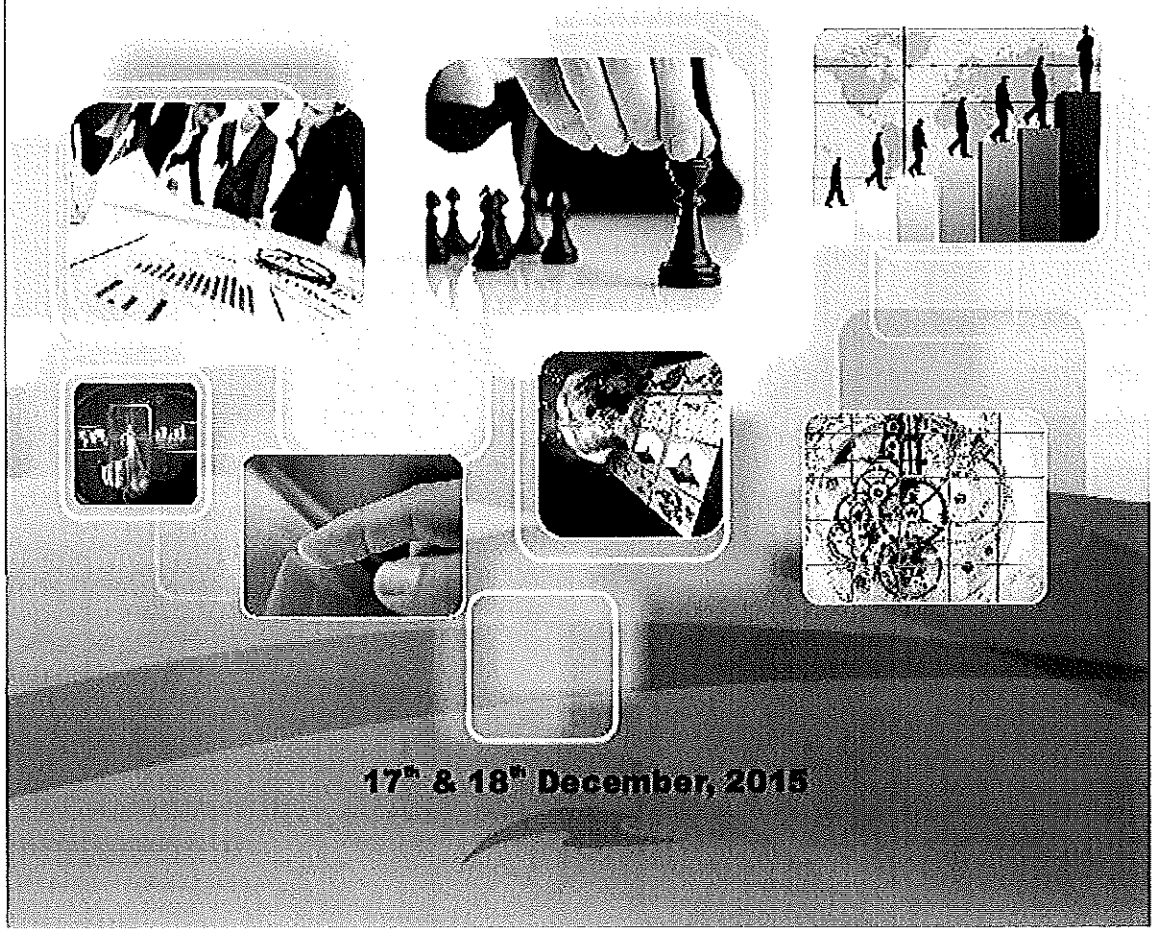

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CONTENT

Part-A

A PATH TOWARDS TECHNOLOGY DRIVEN EDUCATION: ATTITUDE OF TEACHERS TOWARDS INNOVATIVE TEACHING PRACTICES

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ABSTRACT

In today's Digital Age, teaching and learning is becoming dynamic. Technology is used to create unique teaching and learning experiences. Universities and campuses are moving towards technology adopted teaching and learning practices. In the global perspective, this shift is considered as an innovative practice in education. Even though most of the teachers are shifting themselves to technology adopted teaching, there is a bit concern of adopting technology. Technology driven education can lead quality in education.Due to technology adopted teaching practices, teachers' role is shifting from the information provider to a

mentor or facilitator. This empirical research study is done to understand the attitudeof teachers towards innovative teaching practices.

Keywords: Innovative Teaching, Attitude, Quality Teaching, Technology

1. Introduction:

Technological advancement has resulted in changes in teaching methodology and innovative pedagogical practices. In today's Digital Age, teaching and learning is becoming dynamic. Technology is used to create unique teaching and learning experiences. Universities and campuses are moving towards technology adopted teaching and learning practices. In the global perspective, this shift is considered as an innovative practice in education. Even though most of the teachers are shifting themselves to technology adopted teaching, there is a bit concern of adopting technology. Technology driven education can lead quality in education. Due to technology adopted teaching practices, teachers' role is shifting from the information provider to a mentor or facilitator. Although not well understood, there is also a growing bod of research to support the use of physical activity to increase academic performance (Centers for Disease Control an Prevention [CDC], 2010; Fox, Barr-Anderson, Neumark-Sztainer, & Wall, 2010; Reed et al., 2010). Most recently the CDC (2010) released a comprehensive review reporting a significant association between physical activity and academic performance, which encompasses cognitive skills, academic behaviors, and academic achievement.

2. Review of Literature:

Students learn through cognitive and experiential means. From the students' perspective, cognitive learning happens through communication skills, critical learning skills and also

problem solving skills. While delivering cognitive skills to students, we need to look into teaching style of teachers. The focus should be on what students learn and also the learning outcome. Education accreditation bodies are focusing more on innovation teaching and impactful engagement of students in the classroom learning. There is a potential impact on innovation in teaching and student engagement.

Use of the term "innovative" to describe the combination of the three teaching practices described below is intentional. Student centered pedagogy and extending learning beyond the classroom are concepts that have very long histories. The term "innovative" in the context of this research describes combining these practices with technology to solve teaching and learning challenges in new ways. It is the combination of these pedagogical practices with technology that has the potential for real innovation (2013, Microsoft Partners in Learning School Research).

The implementation of innovative technologies in school is a complex process that enquires cre-ating a pedagogical, technological, and managerial systemic change in the school-culture – a process that usually fails to meet the high expectations and to create the systemic change. In light of the many recent studies, which indicate that teachers' perception and attitudes play a pivotal role of in the success or the failure of technology-implementation projects, the present study explores the teachers' perceptions and attitudes towards the implementation of an innova-tive technology (smart class).

The teachers' attitudes towards change and their readiness to become active partners is considered a critical success factor (Avidov-Ungar, 2010; Coffman, 2009; Day &Gu, 2007; Fullan& Smith, 1999). Similarly, resistance to change is considered one of the main reasons for failure of proc-esses that involve change in organizations in general and in the educational systems in particular (Fullan& Hargreaves, 1996; Zimmerman, 2006). In the case of innovative technology implemen-tation in schools, teachers' resistance is reported by some studies to be the most important factor in the project's success (Del Val & Fuentes, 2003), mainly because the technology doesn't fit to their pedagogical practices and beliefs (Halverson & Smith, 2009; Harris & Hofer 2009). Accord-ing to Del Val and Fuentes (2003), resistance to change is divided into cognitive resistance (fo-cused on identifying and

presenting weaknesses of the change and enlisting claims and reasons for maintaining the existing situation) and emotional resistance (focused on expressing negative feelings towards the change, such as anger, disdain, hostility or sadness). Emotional resistance is also accompanied by psychological symptoms such as tension, impatience, pessimism, apathy and disinterest. In many cases, resistance to change becomes active resistance, in which participants actively sabotage the process of change (Zimmerman, 2006).

3. Research Objectives

The main objectives if this research is to study the attitude of teachers' technology driven education. When it comes to investigation, two principal research objectives have been identified and to address the phenomenon under this study, following two objectives provided to use.

Research Objective 1: To study the factors affecting technology driven education.

Research Objective 2: To analyze the attitude of teachers towards innovative teaching practices.

4. Research Questions

Research question of this study is derivative from the evidance source of research objectives established and litrature. To achieve the above objectives, the following research questions were demonstratedfor this study.

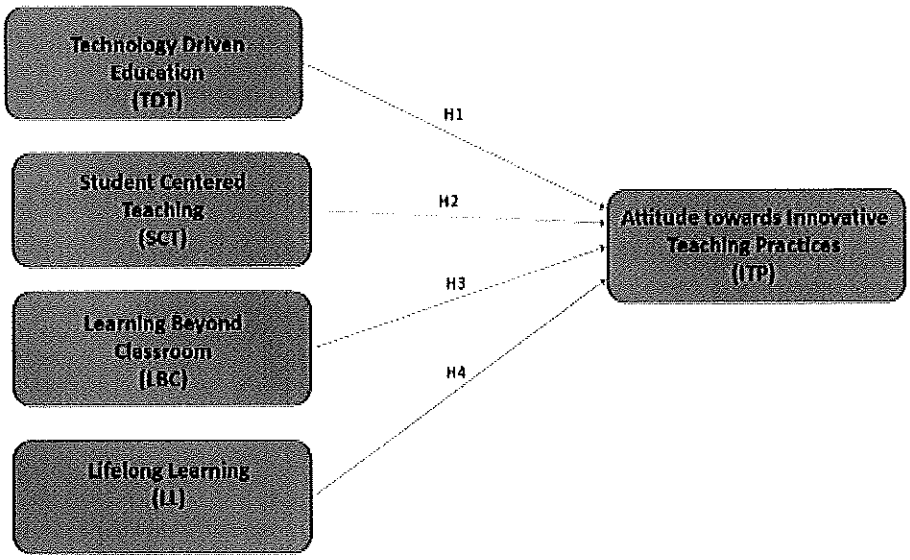
Research Question 1: What are the factors affecting technology driven education?

Research Question 2: What is the attitude of teachers towards innovative teaching practices?

Research Question 3: What is the most relevant factor affecting technology driven education?

5. Research Framework

Based on the literature presented in this study, the main four variables was chosen and the following framework was drawn. Framework is consisting of four independent variables labelled as (1) Technology Driven Education (2) Student Centered Teaching (3) Learning Beyond Classroom (4) Lifelong Learning. As the study will focus on attitude of teachers, therefore the dependent variable will be attitude towards innovative teaching practices and the impact of innovative teaching for students.



6. Hypothesis of the study

H1.There is a positive relationship between technology driven education and innovative teaching practices.

H2. There is a positive relationship between student centered teaching and innovative teaching practices.

H3. There is a positive relationship between learning beyond classroom and innovative teaching practices.

H4.There is a positive relationship between lifelong learning and innovative teaching practices.

7. Methodology

Primary data

Primary data will be collected using a five-section questionnaire. Section A of the questionnaire measured different demographic attributes of the respondents. These included age, gender, education levels and job position. Section B of the questionnaire will be consisting four main variables, which are1) Technology Driven Education (2) Student Centered Teaching (3) Learning Beyond Classroom (4) Lifelong Learning. Variables was measured using Likert scale (where 1=strongly disagree, 5= strongly agree) which was adapted from the scale that was used by Smith, Kendall and Hulin (2012).

Secondary data

In this study, mostly secondary data are extracted from online resource such as journal articles of relevant study field which are adopted from Emerald Library Database, ProQuest Database and Science Direct database which can be found online library databases. Journal articles been used in this study are taken from the year of 2000 and up to date.

Target population

According to Hair & Bush (2006), target population is "said to be a specified group of people or object for which questions can be asked or observed made to develop required data structures and information". Therefore as mentioned earlier the main population will be teachers currently working at universities from Asia (India, Malaysia, Indonesia, Bangladesh and Pakistan)and who are teaching graduates and post graduates and obtained degree and above as their educational qualifications.

Sampling selection

As per Malhortra& Peterson (2006) and Zikmund (2009) "in order to generate data more accurately, large number of sampling size should be needed, but in different situation the sampling size will differ as well". With regard this a sample represents 5% -10% of total population, 150 questionnaire was distributed among the teachers at university level from various universities across the world to achieve the response rate of 78%, where 150 sample was determined using convenience sampling method approved from Krejcie, and Morgan (2013).

8. Measuring instrument

The research instrument that used by this study is survey questionnaire. The purpose of using questionnaires survey is because of the direct response and feedback from the respondents that can be collected in short period of time and in an easier manner (Chee Hong , et al., 2012). The questions were selected from four independent variables which were identified as factor determining attitude of teachers namely, technology driven education, student centric teaching, learning beyond classroom, and lifelong learning. The questionnaires will be send to respondents through online and email as per Boustani, (2014) mentioned that this methods would be easy and faster to reach large number of population within a given period of time.

Table 8.1: Variable & instrument measuring

Research Variables	Items
Technology Driven Education (TDE)	Satisfied with the technology driven education(TDE1)
	There has been a change in education through technology over the years (TDE2)
	Technology driven education are well structured to help the students to learn more effective (TDE3)
	There is effective training and development provided to enhance

	technology into education (TDE4)
	Technology driven education is the most significant method of education (TDE5)
	Basic and higher level of technology in education brings deep student learning (TDE6)
Student Centered Teaching (SCT)	Allow students to choose their own learning process (SCT1)
	Allows students to choose their own topics of learning (SCT2)
	Allows students to choose their own pace of learning (SCT3)
	Make students more responsible participants in their learning (SCT4)
	Students can bring in a quality of work through technology adopted learning (SCT5)
	Technology driven education can bring in positive outcome towards learning (SCT6)
Learning Beyond Classroom (LBC)	Technology driven education can bring high performance amongst the student (LBC1)
	Satisfied with the outside classroom approach/extended classroom approach (LBC2)
	Technology enhanced teaching is an attractive mode of teaching practice (LBC3)
	Technology driven teaching practice offered by the organization motivates all teaching practitioners (LBC4)
	Effective for students from outside class who are from other countries or cultures (LBC5)
	Technology can provide advance knowledge and engage in active learning (LBC6)

Lifelong Learning (LL)	Technology driven concept of learning process brings lifelong learning than tradition learning apprach(LL1)
	I Believe that technology driven learning provide lifelong learning (LL2)
	I believe flexible teaching and learning hours can bring lifelong learning (LL3)
	I believe technology driven learning can connect global communities and bring lifelong learning (LL4)
	I believe technology driven learning can increase sophistication in technology and intercultural learning (LL5)
	I believe technology driven learning can disseminate information and knowledge and bring lifelong learning (LL6)
	Overall satisfied with present technology driven education and believe it brings in lifelong learning (LL7)
	Technology driven education brings wholesome development and Lifelong learning (LL8)
Innovative Teaching Practice (ITP)	I believe innovative teaching practices will bring professional growth for students (ITP1)
	I believe innovative teaching practices is the best extended learning beyond classroom. (ITP2)
	I believe innovative teaching practices will enhance quality learning for students (ITP3)
	I believe innovative teaching practices will engage practice based learning (ITP4)
	I prefer using innovative teaching practice to enhance knowledge for students (ITP5)
	Overall, I believe innovative teaching practices will bring a change in student learning approach (ITP6)

Validity and Reliability

Healy & Perry (2000), explain that validity determines "the measuring instrument's ability to measure what it is supposed to measure". According to Healy & Perry (2000), reliability indicates "the degree of consistency and stability of the items used in measuring instrument". It is also important that all the sources and information used for the research purpose are obtained from the reliable sources as well, thus this will increase the credibility of the study.

Firstly, for the purpose of literature review data collection was completed from recognized platforms that confirm that the evidence collected remained reliable. Therefore most of the research pares and journals were taken from recognized data bases such as Emerald, ScienceDirect, and Ebscohost as well as other reliable sources. Additional online information was taken only from official websites related to government that in common have great reliability.

Cronbach's Alpha was used in the research to check as a measure of reliability and internal consistency. They Cronbach's Alpha is a reliability coefficient that indicates how well items in a set are positively correlated to one another. It measures the inter-correlations among each items, with a measure of 1 being higher in terms of internal consistency and if the computed result shows between, 0.70 to 0.95 then it is considered being acceptable (Hair et al., 2011).

9. Data analysis

Summary descriptive statistics will be extracted from responses to the first 4 questions to determine demographics of the respondents. Data will be then analyzed using various statistical tools to study the relationship between the independent variable and dependent variables and other appropriate tools to analyze using the Statistical Package for the Social

Sciences (SPSS statistics 22.0) which was also used by Usha & Devanshi, (2013). The motive of using SPSS is, the software is very much user friendliness, ability to conduct various statistical techniques (Hom, 2006) that will benefit to achieve the research objectives.

SmartPLS was used to analyze the factor analyze Cronbach's alpha, multiple regression analysis between talent management (independent) variables towards employee retention (dependent variable).

Table 9.1: Summary of Demographic Analysis

Measures	Items	Frequency	Percentage
Gender	Male	56	33.7%
	Female	94	62.7 %
Age Group	30-30	80	53.3%
	40-49	65	43.3%
	50-59	5	3.3%
Experience	Less than 1 year	19	12.7%
	1-5 years	73	48.7%
	5-10 years	24	16%
	19-15 years	30	20%
	< 15 years	4	2.7%
Qualification	Bachelor's Degree	123	82%
	Master's Degree	27	18%
	Doctorate Degree	0	0%

Internal consistency of Reliability & Indicator Reliability (outer loadings)

When evaluate the internal consistency of the model, the values of CR should be greater than 0.7 and below than 0.9. If any item loading shows below 0.7 and above 0.9 that item should

be removed following any values above 0.7 should be considered as reliable (Hair et al., 2010).

The present study, there are 12 items that are more than 0.7. 14 items were extracted from the model since the loadings are below 0.7. The Extracted loadings are TDE2 (0.524), TDE4 (0.205), TDE6 (-0.391), SCT1 (0.333), SCT2 (0.476), SCT6 (0.141), LBC3 (0.622), LBC5 (0.271), LBC6 (0.41), LL1 (0.513), LL2 (0.325), LL3 (0.137), and LL8 (0.293).

Below shows factor loadings results. When the sample size is 85 and above, convergent validity should be done to test and observe whether all the factor loadings are greater than or above 0.7 (Zikmud, 2007). Since the present study shows the factor loadings of all the variables are greater than 0.7 and below 0.9 it can be said that the main construct used in the present study is adequately reliable.

Table 9.2:, Factor loadings after extraction

Construct	Items	Factor loadings
Technology Driven Education (TDE)	Satisfied with the technology driven education(TDE1)	0.869
	Technology driven education are well structured to help the students to learn more effective (TDE3)	0.732
	Technology driven education is the most significant method of education (TDE5)	0.854
Student Centric Training (SCT)	Allows students to choose their own pace of learning(SCT3)	0.935
	Allows students to choose their own pace of learning(SCT4)	0.889
	Students can bring in a quality of work through technology adopted learning (SCT5)	0.800
Learning Beyond Classroom	Satisfied with the current salaries & wages offered by the organization (LBC1)	0.848

(LBC)	Satisfied with other non-monetary rewards offered by the organization (LBC2)	0.849
	Compensation package offered by the organization motivates for better employee performance (LBC4)	0.782
	I believe technology driven learning can connect global communities and bring lifelong learning (LL4)	0.722
Lifelong Learning	I believe technology driven learning can increase sophistication in technology and intercultural learning (LL5)	0.879
(LL)	I believe technology driven learning can disseminate information and knowledge and bring lifelong learning (LL6)	0.764
	Overall satisfied with present technology driven education and believe it brings in lifelong learning (LL7)	0.807
	I believe innovative teaching practices will bring professional growth for students (ITP1)	0.802
	I believe innovative teaching practices is the best extended learning beyond classroom. (ITP2)	0.915
Innovative Teaching Practice	I believe innovative teaching practices will enhance quality learning for students (ITP3)	0.971
(ITP)	I believe innovative teaching practices will engage practice based learning (ITP4)	0.967
	I prefer using innovative teaching practice to enhance knowledge for students (ITP5)	0.942
	Overall, I believe innovative teaching practices will bring a change in student learning approach (ITP6)	0.947

Convergence Validity

As per Esposito (2010) when reflective measurement model is to be assessed as convergence validity, then the Average Variance Extracted (AVE) should be greater than 0.5. Since all the

AVE constructs of the present study is higher than 0.6 convergent validity shows the meaning of all indicators of same construct positively correlate with each other.

Table 9.3: validity and reliability

Construct	Composite Reliability	Items	Loading	AVE
Technology Driven Education	0.860	TDE1	0.869	0.674
		TDE3	0.733	
		TDE5	0.854	
Student Centric Training	0.908	SCT3	0.935	0.768
		SCT4	0.889	
		SCT5	0.800	
Learning Beyond Classroom	0.866	LBC1	0.848	0.684
		LBC2	0.849	
		LBC4	0.782	

Construct	Composite Reliability	Items	Loading	AVE
Lifelong Learning	0.872	LL4	0.722	0.632
		LL5	0.879	
		LL6	0.764	
		LL7	0.807	
Innovative Teaching Practice	0.973	ITP1	0.802	0.857
		ITP2	0.915	
		ITP3	0.971	
		ITP4	0.967	

ITP5	0.942
ITP6	0.947

Composite Reliability

There are 5 factors and 32 items tested to achieve the Cronbach's Alpha of the study.

Table 9.4: Cronbach's Alpha measurement for all variables

Factor	Cronbach's Alpha	Number of Item
Variables	0.846	32

When testing the Cronbach Alpha, all the values should be higher than 0.7 (Babbie, 2001). He also mention that if the Cronbach's alpha values are more than 0.9 than it is considered as a very strong value. In the present study the overall Cronbach alpha is 0.846, which is above 0.7, therefore, the construct of all the variables are good and reliable.

Table 9.5: Composite Reliability Test (Cronbach's Alpha)

Factor	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Technology Driven Education	0.836	-0.015	6
Student Centric Learning	**0.967**	-0.075	6
Learning Beyond Classroom	0.816	0.010	6

Lifelong Learning	0.762	-0.195	8
Innovative Teaching Practice	0.853		6

The above tables shows the final Cronbach's Alpha of each individual variables. Cronbach's Alpha for each independent variable and dependent variable should be more than 0.7 for all social science studies as per (Saunders, 2007). Reliability for Technology Driven Education is good and overall Cronbach's alpha is 0.836 (>0.7) and contains six items. Reliability for Student Centric Teaching is also good and overall Cronbach's alpha is 0.967 (>0.7) and it contains six items. The reliability for Learning Beyond Classroom is good and overall Cronbach's alpha is 0.816 (>0.7) which contains six items. The reliability for Lifelong Learning is also good and overall Cronbach's alpha is 0.762 (>0.7), and it contains eight items. The reliability for Innovative Teaching Practice is good as well and overall Cronbach's alpha is shows as 0.853 (>0.7) and contains six items.

Findings of factor analysis

As per Bougie&Sekaran (2010) if the Cronbach's Alpha shows above 0.7 and closer to 1, the internal of reliability of the study is very high. According to Hair et.al (2010) any value above 0.6 will be accepted to check the internal consistency of the model. Since all the values of this study model shows above 0.7, whole questionnaire is very reliable.

Discriminant Validity

For the purpose of discriminant validity both the cross loadings and square root of AVE (which is also known as Fornell –Lacker) should be tested. Hair at al (2010) mention that AVE should be greater than the correlations between the constructs. Table 9.6 shows that square root of AVE is greater than the correlation with other constructs.

Variable	1	2	3	4	5
1. Learning Beyond Classroom	**0.827**				
2. Innovative Teaching Practice	-0.103	**0.926**			
3. Lifelong Learning	o.428	-0.228	**0.795**		
4. Technology Driven Education	0.304	-0.139	0.566	**0.821**	
5. Student Centric Teaching	0.329	-0.150	0.385	0.226	**0.876**

Table 9.6: Fornell-Lacker Criteria (Square root of AVE)

Furthermore, same time all the indicators loadings under their own constructs should also have to be greater than other cross loadings with remain constructs (Hair 2010). Table 9.7 shows the satisfied requirements of all cross loading constructs.

Items	LBC	ITP	LL	TDE	SCT
LBC1	0.848	-0.064	0.340	0.271	0.193
LBC2	0.849	-0.102	0.385	0.208	0.413
LBC4	0.782	-0.081	0.326	0.291	0.155
ITP1	-0.077	0.802	-0.103	-0.062	-0.090

Tabl 9.					
ITP2	-0.064	0.915	-0.132	-0.058	-0.129
ITP3	-0.136	0.971	-0.252	-0.151	-0.172
ITP4	-0.124	-0.967	-0.239	-0.168	-0.131
ITP5	-0.037	0.942	-0.214	-0.127	-0.119
ITP6	-0.109	0.947	-0.249	-0.149	-0.167
LL4	0.106	-0.173	0.722	0.267	0.341
LL5	0.418	-0.247	0.879	0.512	0.196
LL6	0.420	-0.139	0.764	0.553	0.417
LL7	0.519	-0.069	0.807	0.515	0.414
TDE1	0.373	-0.138	0.510	0.869	0.326
TDE3	0.087	-0.086	0.424	0.733	0.154
TDE5	0.230	-0.109	0.453	0.854	0.038
SCT3	0.325	-0.167	0.360	0.183	0.935
SCT4	0.220	-0.122	0.244	0.124	0.889
SCT5	0.331	-0.087	0.445	0.344	0.800

7:Results of cross loadings

Therefore based on the tests of Fornell-Lacker criterion as well as the cross loadings it can be conclude that the discriminant validity of the study are satisfied with each construct of the study model which also is identical from other constructs by empirical evidence.

Multicollinearity calculation

Multicollinearity is to do to check whether each independent variable has direct effect or relationship among other independent variables in the model. To check the multicollinearity, variance inflation factors (VIF) assessed. According to Esposito (2010) variance inflation factors (VIF) should be greater than 5, if any value is below than 5 it is considered as low

multicollinearity. For the present study the VIF shows all the variables are below 5, representing low multicollinearity and model is valid.

Table 9.8: VIF inner values

Item	ITP
LL	1.757
TDE	1.481
LBC	1.283
SCT	1.221
ITP	

Multiple Regression Analysis: Hypothesis testing

As mentioned by Hair (2010) In order to get an accurate results for the hypothesis 5,000 times of bootstrapping should be done to test hypothesis. Therefore, for the purpose of this study 5,000 times of bootstrapping was done to test hypothesis and to get accurate result.

Table 9.9: Path coefficient

Item	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Value
TDE - ITP	0.297	0.326	0.124	**2.406**	**0.016**
LL – ITP	0.329	0.282	0.172	1.916	0.055
LBC – ITP	-0.449	-0.372	0.230	1.957	0.050
SLT - ITP	0.049	0.052	0.100	0.488	0.626

Findings of Multiple Regression analysis

As summarize in the below table 9.10, three hypothesis namely Student Centric Teaching, Learning Beyond Classroom, and Lifelong Learning was rejected and only one hypothesis which is Technology Driven Education was accepted.

Table 9.10: Summary of Hypothesis

Hypotheses	Finding	Conclusion
H1: There is a positive relationship between technology driven education and innovative teaching practice	T value = 2.406 P value = 0.016 Signiant at 1% level	Accepted
H2: There is a positive relationship between lifelong learning and innovative teaching practice	T value = 1.916 P value = 0.055 Not significant	Rejected
H3: There is positive relationship between learning beyond classroom and innovative teaching practice	T value = 1.957 P value = 0.050 Not Signiant	Rejected
H4: There is be a positive relationship between student centric learning and innovative teaching practice	T value = 0.488 P value = 0.626 Not Significant	Rejected

10. Discussion and Conclusions:

Implementation of technology into teaching methodology in universities is a complex process which will require a synergy between university managerial team and teaching fraternity.

From this research study it's very clearly observed that technology has been accepted by teachers in an effective manner and teachers are ready to accept innovative teaching practice. In general, teachers attitude as educators understand that this can bring professional development and growth amongst students. They also believe that innovative teaching practice will enhance quality learning for students. Teachers also prefer using technology to provide extensive knowledge to students. Many teacher believe that technology driven teaching is not really incorporating lifelong learning. They believe in the concept of blended teaching where traditional method and modern method is incorporated. Even though technology driven teaching disseminate information and knowledge teachers do not accept this method to be totally into lifelong learning process. This research study illustrates that many of the teachers accept the fact that technology driven teaching and learning process make students to learn at their own pace of learning. Even though technology driven teaching skill are the present mantra of the 21st century, we need to understand the attitude of teaching who implement this into practice and support diversified learners worldwide. Every teacher should synthesize and practice to enhance themselves into blended or online teaching approach and accept the global settings.

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