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**THE INFLUENCE OF STUDENTS' FEEDBACK ON TEACHING  
EFFECTIVENESS AND STUDENTS' SATISFACTION AT HIGHER EDUCATION  
LEVEL: STUDENTS' PERSPECTIVE**

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**Abstract :** *The aim of this explanatory research is to investigate the impact of student feedback on teaching effectiveness and students' satisfaction at higher education level as supported by Theory of Intellectual Management (Zhou, Hu, Yu & Bai, 2019), Behaviorist theory of learning, B.F Skinner 1904) and Maslow's Theory Hierarchy of Needs (1943). The problem is that despite spending billions of rupees by Government of Pakistan, students' feedback has not been implemented to enhance quality teaching and students' satisfaction in HEIs, Pakistan. A useable sample of 1066 were collected from ten public and private universities of Sindh. SPSS v.22 and AMOS v.22 were used to analyze second order and first order reflective measures. CFA model was established before testing hypotheses. The findings suggested that students' feedback has a significant impact on teaching effectiveness and teaching effectiveness has a significant impact on students' satisfaction as ( $\beta=1.553$ ,  $p$  value=0.000) and ( $\beta=0.981$ ,  $p$  value=0.000) respectively. This study is of a paramount importance for policy makers and stakeholders of Higher Education Institutions in implementing student feedback to improve teaching effectiveness and students' satisfaction.*

**Keywords:** *Students' feedback, Feedback Belief, Feedback Importance, Feedback Effect, Teaching effectiveness and students' satisfaction, Higher Education Level.*

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## **1 Introduction**

Student feedback is considered as one of the best tools for quality teaching and learning process (Andersson and Weurlander 2019). Today student feedback is collected throughout the world in various settings, to ensure students satisfaction (Meikleham and Hugo 2019). The Higher Education of Pakistan declared student feedback mandatory in all higher education institutions of Pakistan. The problem is that students are not satisfied with the quality of higher education imparted at the universities despite the investment of billions of rupees budget by the Higher Education Commission of Pakistan.

The purpose of this quantitative study in nature is to examine the impact of students' feedback on teaching Effectiveness and students' satisfaction at higher education level. The present study focused on the following two important objectives.

- I. To determine the relationship between students' feedback and teaching effectiveness at higher education level.
- II. To determine the relationship between teaching effectiveness and students' satisfaction at higher education level.

Student feedback was initiated from University of Washington 1920s, with a purpose to make faculty more familiar with the student needs. Today, Student feedback is considered as prominent aspect of quality teaching and learning in higher education institutions of world and also in Pakistan. Student feedback helps faculty to address shortcomings identified by the students with an intention to improve teaching process and students, satisfaction.

Eng, Ibrahim and Shamsuddin (2015) pointed out that student feedback improved performance in course material, assessment techniques, classroom organization and classroom interaction. Uttl, White and Gonzalez (2017) stated that students' evaluation of teaching is based upon the assumptions that students are learning from assessed teachers and they feel satisfied with the learning process.

Ganal (2015) briefed that teaching is a diverse profession "It demands efficiency, effectiveness, and commitment because every teacher is mandated to develop holistically the learner. The learner may be equipped with lifelong knowledge, skills, attitudes, and values for complete and productive living".

Yerdelen and Sungur (2019) conducted cross sectional study on learning environment and teachers' teaching effectiveness at school level. The results indicated that the classroom learning environment has influence on students' learning in science classes.

Butt and Rehman (2010) conducted study in public and private higher education institutions of Pakistan to evaluate the students, satisfaction with the factor's teachers' expertise, learning environment, classroom facilities. The results reveal that teachers' expertise and effectiveness is the most influential factor it has significant and positive impact on the students, satisfaction. The above-mentioned studies have highlighted different aspects of students' satisfaction i, e. accommodation facilities, sports facilities, transport facilities, library facility, classroom facilities scholarship facilities, review of tool, teacher knowledge, content, attitude, skills and learning environment. However, limited research has

been conducted on the impact of teachers' evaluation by the students on teaching effectiveness and students' satisfaction in Pakistan specially Sindh. In the previous studies ( ), the relationship between student feedback and teaching have been left unexplored therefore the present study fills this identified gap by investigating the impact of student feedback on teaching effectiveness at higher education level.

## **1.2 Theoretical and Methodological Contributions**

This empirical study contributes theoretically and methodologically in the existing literature of education with specifically focus on teaching effectiveness and students' satisfaction. Students' feedback has been much researched in the context of western world but there is little work has been done in the context of developing countries like Pakistan. First, this empirical study investigates the impact of student feedback on teaching effectiveness at higher education level. Second, it also investigates the impact of teaching effectiveness on students' satisfaction at higher education level as supported by Theory of Intellectual Management (Zhou, Hu, Yu & Bai, 2019), Behaviorist theory of learning, B.F Skinner (1904) and Maslow's Theory Hierarchy of Needs (1943). Moreover, the relationship between student feedback, teaching effectiveness and students' satisfaction has been left unexplored to date in the context of HEIs, Pakistan. Third, it has been empirically established that students' feedback has a significant and positive impact on teaching effectiveness ( $\beta=1.553$ ,  $p$  value=0.000). Fourth, teaching effectiveness has a significant and positive impact on students'

satisfaction ( $\beta=0.981$ ,  $p$  value=0.000). Fifth,  $R^2$  of teaching effectiveness and students' satisfaction is 0.822 (82.2%) and 0.602 (60.2%) respectively. 82.2% of change in teaching effectiveness is because of students' feedback and 60.2% change in students' satisfaction is because of teaching effectiveness. Nonetheless, using a covariance-based structural equation modeling (CB-SEM) CFA approach, it extends the (Judith Prugh Campbell & Bozeman, 2007)'s three-dimensional reflective-reflective measure (such as feedback belief, feedback importance, feedback effect) in the context of HEIs, Pakistan.

## **Theoretical background and Hypotheses development**

According to, Firestone, (2014) the research proved that best teachers improve student learning. The author incorporated the relevant and supporting theories of study variables to establish the relationship between student feedback, teaching effectiveness and student satisfaction.

### **2.1 Theories relevant with study variables** **i.) Theory of Intellectual Management (Zhou, Hu, Yu & Bai, 2019)**

Zhou, Hu, Yu & Bai, (2019), proposed novel theory an Intellectual Management for University Teacher (IMUT). According to them students can give their feedback regarding the teachers' knowledge, skills, and personality traits and teaching strategies to improve quality of teaching and students 'satisfaction. University teachers are advised to implement Intellectual Management theory to enhance their knowledge teaching skills and personality traits and learning of

students in the classroom. In result students, satisfaction with quality teaching process enhances reputation of the institution.

**ii) Behaviorist theory of learning, B.F Skinner (1904),**

According to B.F Skinner (1904); theory of behaviorism depends upon observable behavior of the individual whether positive or negative. It can be measured and manipulated through stimuli in reward and punishment. Effective teaching is reinforced by the behaviorist theory of the learning which points out that, teachers, should create better learning environment for the students. The cognitive theory also advocates that it is the quality of teaching that engage learners in critical thinking skills for the solution of practical problems

**iii) Maslow's Theory Hierarchy of Needs (1943)**

Maslow's theory focused on timely delivery of student feedback, it will cater the needs of individuals, to address the quality teaching and learning standards process of teachers, evaluation. Moreover, it will lead to improvement and professional progress of individual teachers and satisfy students learning requirements. Effective teaching is measured by students learning and problem-solving skills, cognitive theory is fully supporting it.

**2.2 Hypotheses Development**

**i) Student feedback and Teaching effectiveness**

Student feedback plays significant role in quality of teaching and students' level of satisfaction. According to the Mancha and Murcia (2020) if teachers have command over subject and conduct classes satisfactory surely students feel satisfied and award higher rank in feedback. Eng, Ibrahim and

Shamsuddin (2015), pointed out that student feedback improved performance in course material, assessment techniques, classroom organization and classroom interaction.

Uttl, White and Gonzalez (2017) stated that students' evaluation of teaching was based upon the assumptions that students were learning from assessed teachers and they feel satisfied with the learning process. Teachers evaluation by the students was standardized practice conducted throughout the world. Ganal (2015) briefed that teaching was a diverse profession "it demands efficiency, effectiveness, and commitment because every teacher was mandated to develop holistically the learner. The learner must go out of the classroom equipped with lifelong knowledge, skills, attitudes, and values for complete and productive living". If teacher failed to deliver knowledge and skills to the students, the learners will face in their future life.

Height (1950) explained some qualities of good teacher first he should know the subject and like the subject, like the pupils irrespective of gender boys or girls knowing the pupils their (names and faces) having humor. In addition to this good teacher must possess the abilities of good memory, will-power, and kindness. Ford (1983) described some qualities of effective teaching, teachers should have serious commitment with the profession, he/she should be humane, and ability to deliver students keep continue counseling and investing time in the profession for the betterment of students and the organization. Davies (1981) said teaching effectiveness is an activity performed and managed between the teacher and students successfully. While comparing effectiveness to efficiency, further he explained that

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"Efficiency is doing things right. Effectiveness is doing the right things." (p. 23).

Jimaa (2013) conducted study on student feedback was measure of teaching effectiveness and best gauge of learning at Khalifa University of Science, Technology, and Research, Sharjah Campus, U. A. E. The results confirmed that obtaining student feedback was beneficial for the learning process, critical thinking and independent learning means, faculty may improve their weaknesses, but it should not be considered as sole measure of teaching effectiveness. It was concluded that the efficiency of students rating for teaching effectiveness was moderately correlated with students learning and satisfaction.

Yerdelen and Sungur (2019) conducted cross sectional study on learning environment (teacher support, involvement, investigation, task orientation, cooperation, and equity) and teacher teaching effectiveness at school level. The researcher applied two-stage random sampling technique for the data collection from 372 sciences teachers and 8198 science students in Turkey. The results of this indicated that the classroom learning environment has influence on students' learning in science classes.

Ganal (2015) conducted research to investigate and analyze the perception of students on course evaluation at Philippine Normal University, North Luzon Campus, Alicia, Isabella. The sample of two hundred from Bachelor of Elementary and Secondary Education was collected through random sampling technique. Data were analyzed through descriptive survey and correlation was applied to investigate the perception of

respondents. The results of the study indicated that course evaluation was academically significant and authoritative irrespective of age, sex, academic programs, and year of study.

According to Kelly (2012) in Ontario universities, student evaluation has a great importance for teaching effectiveness it serves three main purposes. Firstly, from the formative perspective student evaluation provide feedback to the faculty for addressing their weakness or improve the contents of teaching. Second purpose of student evaluation was to measure students self-learning and how much they were satisfied with the teaching and learning process. Finally, it served as summative purpose for the management of the institutions for the merit, promotion, award or termination decisions and subject choice selection to students (Kelly 2012 & Centra, 1994).

According to Paolini (2015), teaching excellence contain three pillars that includes students, colleagues, and the teacher. Students provide formative and summative feedback regarding teaching and learning effectiveness. Peers provide positive feedback through identifying strong and weak areas. Finally, self-evaluation makes able faculty to assess his growth and improvement overtime.

Claessens (2020) conducted study at Maastricht University, Netherlands, to assess the students' evaluations to measure teaching effectiveness of faculty in a Problem based learning (PBL). The researcher identified that students do not focus on teaching philosophy as a primary motivator but other dimensions of personality to evaluate faculty. Related to

the above literature review, the following hypothesis was formulated.

*H1: Student feedback has a significant impact on teaching effectiveness at higher education level.*

**ii) Teaching effectiveness and students' satisfaction**

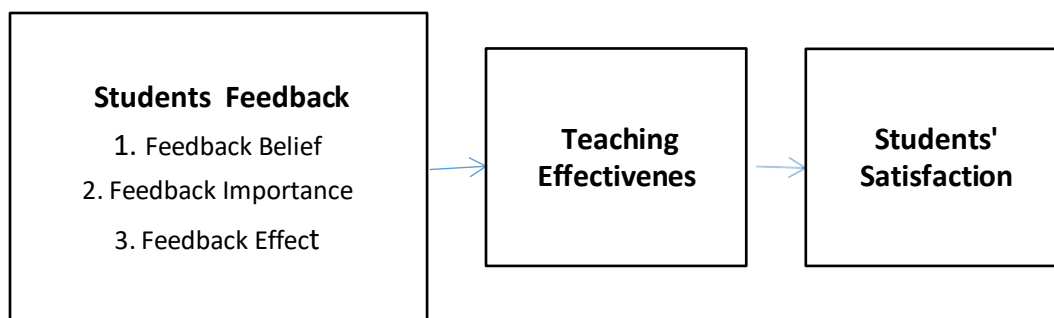
Butt and Rehman (2010) conducted study in public and private higher education institutions of Pakistan to evaluate the students, satisfaction with the factors such as teachers' expertise, learning environment, classroom facilities. The results revealed that teachers' expertise and effectiveness was the most influential factor it has significant and positive impact on the students, satisfaction. Abbasi, Malik, Imdadullah and Choudhry (2011) conducted research study at Bahauddin Zakaria University to measure students, satisfaction in higher education institutions of Pakistan. The construct teaching effectiveness results shows that students were largely dissatisfied with teachers, communication skills, and lecture delivery, classification of curriculum contents nature of assignments and research

work and appropriate time for consultation, irrespective of senior and junior, male or female and regular and visiting.

Belash, Popov, Ryzhov, Ryaskov, Shaposhnikov and Shestopalov (2015) described that university degree programs quality assurance and assessment heavily rely upon the satisfaction of stakeholders through collecting the feedback from students, graduates, alumni, and employers. Kinash, Vishen, Knight, Judd, Nair, Booth, Fleming, Santhanam, Tucker, Tulloch, (2015) strongly supported the idea that student feedback played a pivotal role for the improvement of student learning and engagement. The fundamental purpose of student feedback process is student ranking may be implemented and improvements may be informed to the participants.

Kite, Subedil and Lees (2015) findings indicated that majority of the students has shown satisfaction with their role in current teaching evaluation process and they take evaluation process seriously. Students' evaluation response Reflects that student feedback is very useful for all institutions.

**Figure No 1: Research Model of the present study**



**Source:** Author's contribution

**Notes:** In the above figure, student feedback is reflective-reflective exogenous measure with three dimensions such as feedback belief, feedback importance, and feedback effect.

Moreover, teaching effectiveness and student satisfaction are endogenous measures which are reflective measures in nature.

Paolini (2015) described that faculty can improve their teaching effectiveness through students, feedback. The main purpose of student feedback data collection is to improve teaching practices, to meet the student and program needs above all achieve the goals of education. Related to the above the following hypothesis was formulated.

*H2: Teaching effectiveness has a significant impact on student satisfaction at higher education level.*

### **3 Research Methodology**

The study results reported in this paper are the part of authors' doctoral research (dissertation). The current study aims to investigate the impact of student feedback on teaching effectiveness and students' satisfaction at higher education level. The research philosophy of this study is positivism and the research design is explanatory design. The research approach is deductive reasoning. The type of investigation is causal study and study setting is natural setting. Data were collected from undergraduate engineering students in natural university environment.

#### **3.1 Population and Sample**

The population of the current study is  $n = 10$  (i.e. 06 public and 04 private) higher education institutions accredited with the Pakistan Engineering Council (PEC) in Sindh province.

The sample size is  $n=1066$  students enrolled in the four accredited engineering programs (civil, mechanical, electrical and electronic engineering) randomly selected from ten

engineering universities of Sindh. (Cohen, Manion and Morrison 2007)

#### **3.2 Operational Definition and Measurement Student feedback (Exogenous Variable)**

Students' feedback is an exogenous variable which refers to concentrate on the students' opinion regarding their belief about the importance of student feedback and effect of student feedback on the quality enhancement of academic teaching and learning in the public and private engineering universities of Sindh Province, Pakistan. This construct was measured by 15 items adapted from Campbell and Bozeman (2007) in the form of three dimensions as follows; feedback belief contains (seven items), feedback effect having (four items), and feedback importance has (four items). One sample from each sub scale includes "students should do formal evaluations of their teachers", "students' evaluations are important to the administrators", and "teachers change their assessment results based on student feedback evaluations", respectively. All of these items were rated on five-point Likert Scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). There are no reverse coded items in this variable. This construct has been used in various previous studies, demonstrated very good psychometric properties such as the Cronbach Alpha value is .841

#### **• Teaching Effectiveness (Endogenous Variable)**

In this study teaching effectiveness is an endogenous variable which refers to

concentrate on the students' views about the teaching effectiveness on quality of delivery and students' learning in the public and private engineering universities of Sindh Province, Pakistan. This construct was measured by (ten items), adapted from Aregbeyen (2010) in the form of one-dimension teaching effectiveness which has been used in various research studies. The construct has demonstrated very good psychometric properties such as the Cronbatch Alpha value is .916 One sample from scale includes "the teacher gives a clear explanation". All of these items were measured through five-point Likert Scale starting from 1= strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree and 5 = strongly agree). There were no reverse coded items in this variable.

- **Student Satisfaction (Endogenous Variable)**

Students' satisfaction is an endogenous variable which refers to concentrate on the students' views about the effect of teaching effectiveness on students' satisfaction for the quality of teaching and learning in the public and private engineering universities of Sindh

Province, Pakistan. This construct was measured by (nine items), adapted from Esmael (2017), in the form of one dimension teaching effectiveness, the construct has been used in various research studies, demonstrated very good psychometric properties such as the Cronbatch Alpha value is .916. Study used five-point Likert Scale ranging from (01 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 05 = Strongly Agree).

### **3.3 Statistical Techniques**

The data were entered in SPSS (Statistical package for social sciences) version IBM-22 in which data screening procedure was performed. In SPSS, CMVB and EFA were also performed. After establishing CFA model, SEM technique was performed to test the hypotheses using statistical software, AMOS version 22.

### **3.4 Reliability of pilot study and main study**

The Overall Cronbach Co-efficient Alpha value for pilot study was .0893 (Hair et al., 2010). The reliability of the instrument was found to be quite reliable to proceed for the main study.

**Table No. 1 Cronbach's Alpha Reliability in pilot study (n=130) and main study (n=1066)**

S. No	Second Order Reflective Measures	First Order Reflective Measures	No. of Items	Alpha in Pilot Study	Alpha in Main Study
1	Student Feedback (Reflective-Reflective Measure)		15	0.785	0.841
		• Feedback belief	07	0.670	0.854
		• Feedback Importance	04	0.768	0.816
		• Feedback Effect	04	0.746	0.761
2		Teaching Effectiveness	10	0.885	0.916
3		Student Satisfaction	09	0.886	0.916
	Overall Reliability of the Instrument		34	0.893	0.938

**Source:** Authors' calculation

Table 1 shows the overall instrument reliability is 0.938 in the main study. The Alpha of student feedback 15 items is 0.841, whereas, student feedback has three dimensions i.e. Students' Belief (7 items), Feedback Importance (4 items), and Feedback Effect (4 items) and the Cronbach Alpha Reliability was 0.854, 0.816, and 0.761 respectively. The Cronbach Alpha Reliability of Teaching effectiveness (10 items) was 0.916 and student satisfaction (9 items) was 0.916 which is greater than the threshold value 0.70 (Hair et al., 2010) and therefore all the variables used in the main study were reliable.

Table-2 indicated that there was n= 878 (82.4%) male participants and n=188 (17.6%) female participants in the selected higher education institutions. Of the total

1066 sample n=766 (71.9%) enrolled in the public higher education institutions and n=300 (28.1%) in the private higher education institutions. Regarding marital status n=48(4.5%) participants were married and n=1018 (95.5%) unmarried. The participants in civil engineering program was n=232 (21.8%) electrical engineering n= 269 (25.2%), mechanical engineering n=288 (27%) and in electronic engineering n=277 (26%). The socio-economic background of the participants describes that there was n=307 (28.8%) lower class students, n= 608 (57%) middle class students and only n=151 (14.2%) belongs to upper class. The researcher checked the validity of the instrument and it was found to be quite good to proceed for the confirmatory factor analysis (CFA).

**Table No. 2 Demographic Profile of Respondents in the Main Study (n=1066)**

S. No	Variable	Demographic	Frequency	Percent	Cumulative Percent
1	Gender	Male	878	82.4	82.4
		Female	188	17.6	100.0
2	Institutions	Public	766	71.9	71.9
		Private	300	28.1	100.0
3	Marital Status	Married	48	4.5	4.5
		Un married	1018	95.5	100.0
4	B.E Programs	Civil	232	21.8	21.8
		Electrical	269	25.2	47.0
		Mechanical	288	27.0	74.0
5	Socio-Economic background	Electronics	277	26.0	100.0
		Lower Class	307	28.8	28.8
		Middle Class	608	57.0	85.8
		Upper Class	151	14.2	100.0

**Source:** Authors' calculation

### 3.5 Common Method Variance Bias (CMVB)

Many researchers believe that Common Method Variance Bias (CMVB) test may be conducted in survey study to check that the collected data from single source is free from bias (Yuksel, 2017; Palmatier, 2016; Tehseen, Ramayah, & Sajilan, 2017). The researcher checked the Common Method Variance Bias (CMVB) by using three different methods.

In the first method, Common Method Variance Bias (CMVB) was checked through Harman's Single Factor Test to address the issue of common method variance (CMV) bias the collected data were unbiased in pilot study as total variance explained by five

factors was 24.17% and in the main study, total variance explained by five factors was 34.934% and these values are less than the threshold value 50.0% (Chaubey, Sahoo, & Khatri, 2019). The results indicate that there is no issue of common method variance (CMV) bias (Podsakoff et al., 2012).

Secondly, the researcher used full collinearity testing of outer model. Kock and Lynn (2012), and Kock (2015) suggested that if VIF is less than 3.3 then there is no issue of common method variance (CMV) bias with the data set. The results indicate that the values of all constructs are less than 3.3 which manifests that the data is unbiased, and results can be generalized.

**Table No 3 Full Collinearity Testing of Outer Model (n=1066)**

Constructs	FB	FE	FI	TE	SS
<b>VIF (Tolerance)</b>	1.328 (.753)	1.100 (.909)	1.824 (.548)	2.204 (.454)	2.105 (.475)

**Source:** Author's estimation

**Note:** FB = Feedback Belief, FE = Feedback Effect, FI = Feedback Importance, TE = Teaching Effectiveness, SS = Student Satisfaction.

Thirdly, the researcher also checked common method variance (CMV) bias. Correlation Matrix Procedure. According to Bagozzi et al., (1991) if the correlations of latent constructs  $r > 0.90$  which indicates

common method variance (CMV) bias. However, the correlation of all constructs is less than 0.90 which indicates that the data is unbiased, and results can be generalized.

**Table No 4 Correlation Matrix Procedure (n=1066)**

No.	LC	Mean	SD	Alpha	1	2	3	4	5
1	FB	3.9089	0.7816	0.854	1				
2	FE	3.1658	0.9305	0.761	.231**	1			
3	FI	3.6832	0.8639	0.816	.400**	.237**	1		
4	TE	3.708	0.864	0.916	.460**	.263**	.588**	1	
5	SS	3.5919	0.8721	0.916	.343**	.199**	.612**	.674**	1

\*\* . Correlation is significant at the 0.01 level (2 tailed)

**Source:** Author's estimation

**Note:** LC = Latent Constructs, FB = Feedback Belief, FE = Feedback Effect, FI = Feedback Importance, TE = Teaching Effectiveness, SS = Student Satisfaction.

Therefore, the researcher proceeded for further analysis of main study. Apart from this, Exploratory Factor Analysis (EFA) was performed on SPSS v.22 to check that the factors in research model are valid before performing confirmatory factor analysis (CFA).

**Table No. 5 KMO and Bartlett's Test**

<b>Kaiser-Meyer-Olkin Measure of Sampling Adequacy.</b>		.940
	Approx. Chi-Square	20357.380
Bartlett's Test of Sphericity	Df	561
	Sig.	.000

**Source:** Authors' calculation

**Table No.6 Rotated Component Matrix (RCM)**

Latent Constructs	Indicators	Rotated Component Matrix				
		1	2	3	4	5
Teaching Effectiveness	TE9	.761				
	TE3	.760				
	TE6	.698				
	TE8	.689				
	TE10	.679				
	TE1	.661				
	TE5	.640				
	TE7	.613				
	TE2	.608				
	TE4	.594				
Students Satisfaction	SS6		.723			
	SS2		.715			
	SS7		.713			
	SS4		.703			
	SS8		.699			
	SS9		.684			
	SS5		.663			
	SS3		.656			
	SS1		.644			
Feedback Belief	FB2			.768		
	FB3			.738		
	FB1			.728		

	FB7					.695
	FB6					.664
	FB4					.659
	FB5					.627
Feedback						
Importance	FI1					.734
	FI2					.693
	FI4					.640
Feedback Effect	FI3					.632
	FE2					.807
	FE3					.762
	FE4					.749
	FE1					.670
<b>Eigenvalues</b>		11.877	3.008	2.086	1.968	1.380
<b>% of variance explained</b>		34.934	8.848	6.136	5.787	4.060
<b>Cumulative % of variance explained</b>		17.247	32.551	44.326	52.648	59.765

**Note:** *Extraction Method: Principal Component Analysis.*

*Rotation Method: Varimax with Kaiser Normalization.*

**Source:** Authors' calculation

Table 5 shows that the value of Kaiser-Meyer-Olkin (KMO) is measure of sampling adequacy (Adil & Fatima, 2013). The value of .940% is greater than the threshold value 0.50% which shows the sample size is adequate enough to run exploratory factor analysis (EFA) and Bartlett's Test of sphericity is significant as sig value is .000 (< 0.05) which means that there is a correlation between the items to make factors. Table 6 reflects that all the indicators were loaded into their respective factors and the threshold value for factor loadings in the main study was .60% which is considered stringent criteria to proceed for further analysis. From the RCM, it is clear that all the items are highly loaded as factor loadings was greater than .60 and it is concluded that the instrument is quite valid in terms of convergent validity as items are loaded into their respective factors, construct validity as items are highly loaded into their respective factors, and discriminant validity as no cross loadings into their respective factors which

adequate enough to run exploratory factor analysis (EFA) and Bartlett's Test of sphericity is significant as sig value is .000 (< 0.05) which means that there is a correlation between the items to make factors.

means the validity of the instruments has been established and it also indicates that the total variance explained by five factors in the main study was 59.765% as the threshold value is 60% which is considered good.

### 3.6 Reasons of using AMOS v.22 in present study

Hair, Howard, and Nitzl, (2020) recommended the following reasons to use Covariance-based SEM (CB-SEM).

- “Analyzes all variables together as measurement models” (Hair et al., 2020).
- “Objective is confirming measurement models” (Hair et al., 2020).

- “Generally, requires relatively high sample sizes to produce (robust) parameter estimates” (Goodhue et al., 2012; Reinartz et al., 2009; Rigdon, 2016).
- “Offers goodness-of-fit statistics” (Henseler et al., 2016; Henseler et al., 2014; Henseler & Sarstedt, 2013).
- “Requires models of small to moderate complexity” (Hair et al., 2012a)
- “Can handle reflective-reflective constructs or second order reflective constructs easily” (Hair et al., 2020).

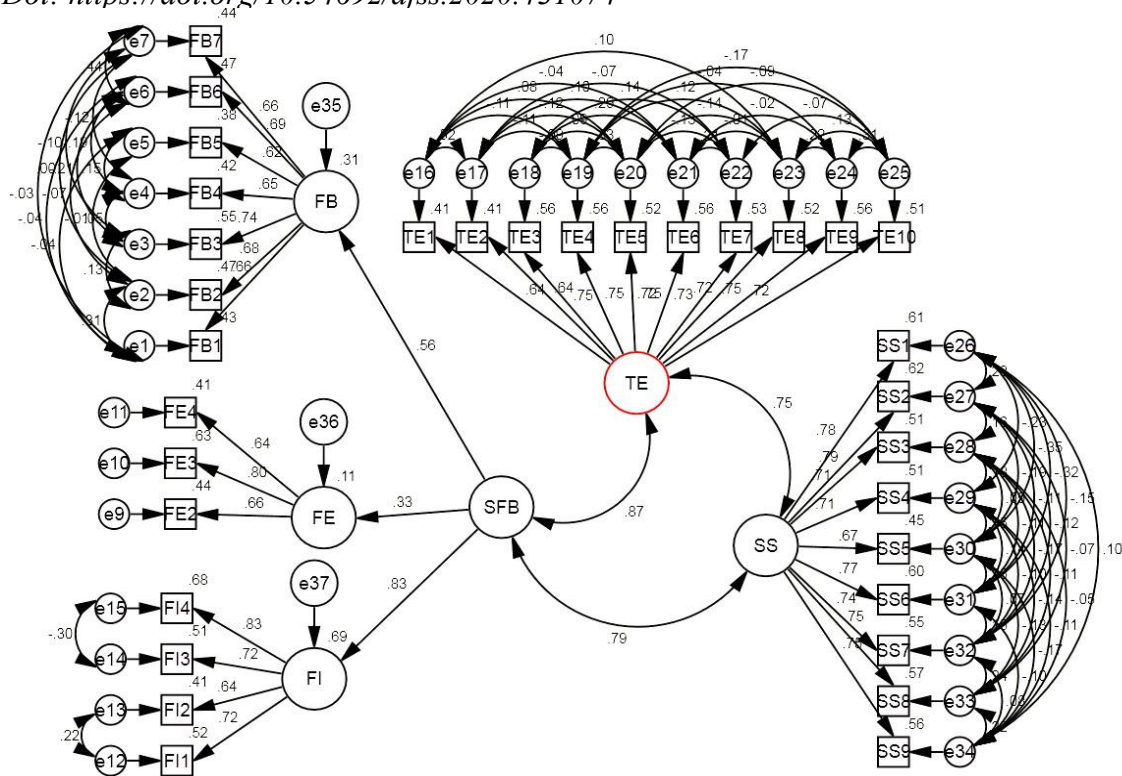
**Table No. 7 CFA Model Fit Indices**

S.No	Index	Goodness of fit	Result	Rationale
1	X2/df or CMIN/DF	$0 \leq X2/df \leq 5$	3.387	Tabachnick and Fidel (2001); Lomax and Schumacher (2004)
2	RMSEA	$0 \leq RMSEA \leq 0.07$	.047	Steiger (2007)
3	SRMR	$0 \leq SRMR \leq 0.10$	.0422	Hu and Bentler (1999); Kline (2005)
4	RMR	$0 \leq RMR \leq 0.10$	.053	Hu and Bentler (1999); Kline (2005)
5	TLI	$0.90 \leq TLI \leq 1.00$	.936	Raykov and Marcoulides (2000)
6	NFI	$0.90 \leq NFI \leq 1.00$	.931	Steiger (2007)
7	CFI	$0.90 \leq CFI \leq 1.00$	.950	Raykov and Marcoulides (2000)
8	GFI	$0.90 \leq GFI \leq 1.00$	.926	Hooper, Coughlan, and Mullen (2008)
9	AGFI	$0.90 \leq AGFI \leq 1.00$	.899	Hooper et al. (2008)

**Source:** Authors’ calculation

Table 7 shows that CFA model is quite fit because all the indices meet the criteria of threshold values or goodness of fit indices. It is concluded the variables in the CFA

model meet the required criteria with respect to model fit. CFA model has been established and SEM technique was used to test the hypotheses



**Figure No 2 CFA Model**

Hair et al., (2020) recommended ensuring the validity and reliability of all the latent constructs. Moreover, the researcher calculated the reliability and validity of all the constructs before testing the hypotheses as shown in the following table no 8.

Table no 8 shows that all the indicators were loaded into their respective factors. The indicators which were less than 6 as the threshold value were deleted. The threshold value of Cronbach's Alpha and Composite Reliability (CR) is greater than or equal to 0.70 considered as quite good and all the five factors meet the required threshold value of Cronbach's alpha and Composite Reliability (CR). The validity of all the five constructs

was ensured by the threshold value of Average Variance Extracted (AVE) which is greater than or equal to 0.50 and therefore all the five constructs meet the required value of AVE which is greater than 0.50. Moreover, the value of R Square is used how exogenous variable predicts the endogenous variable. The students' feedback which is exogenous variable predicts .82% of the teaching effectiveness which is endogenous variable and teaching effectiveness predicts .60% of the students' satisfaction. Finally, the researcher also calculated the discriminant validity of all the five factors as shown in the following table no 9.

**Table No. 8: Factor Loadings, Composite Reliability and Validity (AVE) and R Square**

First-order constructs	Second-order constructs	Items	Loading s	Alph a	CR	AV E	R <sup>2</sup>	
Feedback Belief		FB1	0.736	0.854	0.889	0.535		
		FB2	0.776					
		FB3	0.764					
		FB4	0.693					
		FB5	0.677					
		FB6	0.727					
		FB7	0.741					
Feedback Effect		FE2	0.787	0.744	0.852	0.659		
		FE3	0.872					
		FE4	0.772					
		FE1	0.847					
Feedback Importance		FI1	0.847	0.815	0.878	0.644		
		FI2	0.789					
		FI3	0.763					
		FI4	0.809					
		Student Feedback Belief	0.849				0.744	0.508
		Student Feedback Effect	0.447					
		Student Feedback Importance	0.776					
Student Satisfaction		SS1	0.781	0.916	0.937	0.597	<b>0.602</b>	
		SS2	0.812					
		SS3	0.744					
		SS4	0.749					
		SS5	0.701					
		SS6	0.792					
		SS7	0.781					
		SS8	0.798					
		SS9	0.791					

Teaching Effectiveness	TE1	0.709	0.916	0.93	0.57	<b>0.822</b>
					1	
	TE10	0.75				
	TE2	0.692				
	TE3	0.805				
	TE4	0.746				
	TE5	0.734				
	TE6	0.793				
	TE7	0.755				
	TE8	0.762				
	TE9	0.805				

Note: \*\*\*p<0.05

Source: Authors' calculation

**Table No. 9: Discriminant Validity (Fornell and Larcker, 1981)**

S. No.	Construct	1	2	3	4	5
1	FB	<b>0.773</b>				
2	FE	0.245	<b>0.797</b>			
3	FI	0.367	0.255	<b>0.803</b>		
4	SS	0.324	0.209	0.605	<b>0.773</b>	
5	TE	0.418	0.270	0.597	0.686	<b>0.781</b>

Source: Authors' calculation

Note: Diagonals (in bold) display the squared root of AVE, whereas off-diagonal values are the correlations of factors.

Table 9 shows that the researcher applied discriminant validity approach of Fornell and Larcker (1981), to analyze the research model. The results show that values both in rows and columns are less than the diagonal line in bold numbers which reflect that

discriminant validity is ensured. Moreover, the researcher also checked the correlations of the factors which were found that the variables were correlated to each other as shown in the following table no.

**Table No. 10: Correlations (n=1066)**

S. No	Construct	Mean	Std. Deviation	1	2	3
1	SFB	3.5725	.62419	1		
2	TE	3.7080	.86396	.587**	1	
3	SS	3.5919	.87209	.520**	.674**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Source:** Authors’ calculation

**Note:** SFB=student feedback belief, TE=Teaching Effectiveness, SS= students’ satisfaction.

Table 10 shows that the mean of all the constructs was greater than 3 and standard deviation was even less than 1 which is good thing. Moreover, student feedback was positively and moderately correlated with teaching effectiveness and student satisfaction as .587\*\* and .520\*\* respectively. Teaching effectiveness is positively and highly correlated with student satisfaction as .674\*\*. After establishing the validity and reliability of

the factors, the researcher tested the hypotheses of the study.

**3.7 SEM Model to test the hypotheses**

The researcher ensured the reliability and the validity of the constructs before testing the hypotheses as mentioned above. So, fulfilling all the requirements for the SEM Model wherein the hypotheses were tested as shown in the following table No. 11 and the figure No. 3 of SEM Model.

**Table No. 11: Hypotheses Testing Results of the study**

Hypotheses	Estimate	S.E.	C.R.	P value	Decision
<b>H1:</b> Student feedback has a significant impact on teaching effectiveness at higher education level. TE <- SFB	1.553	.143	10.892	*** (.000)	Accepted
<b>H2:</b> Teaching effectiveness has a significant impact on student satisfaction at higher education level. SS <- TE	.981	.055	17.781	*** (.000)	Accepted

**Note:** \*\*\* $p < 0.01$

**Source:** Authors’ calculation

Table 11 shows that students’ feedback has a significant impact on teaching effectiveness at higher education level ( $\beta=1.553$ ,  $p$  value=0.000) and teaching effectiveness has

a significant impact on students’ satisfaction at higher education level as ( $\beta=0.981$ ,  $p$  value=0.000) respectively. Conclusively speaking, both hypotheses were accepted.

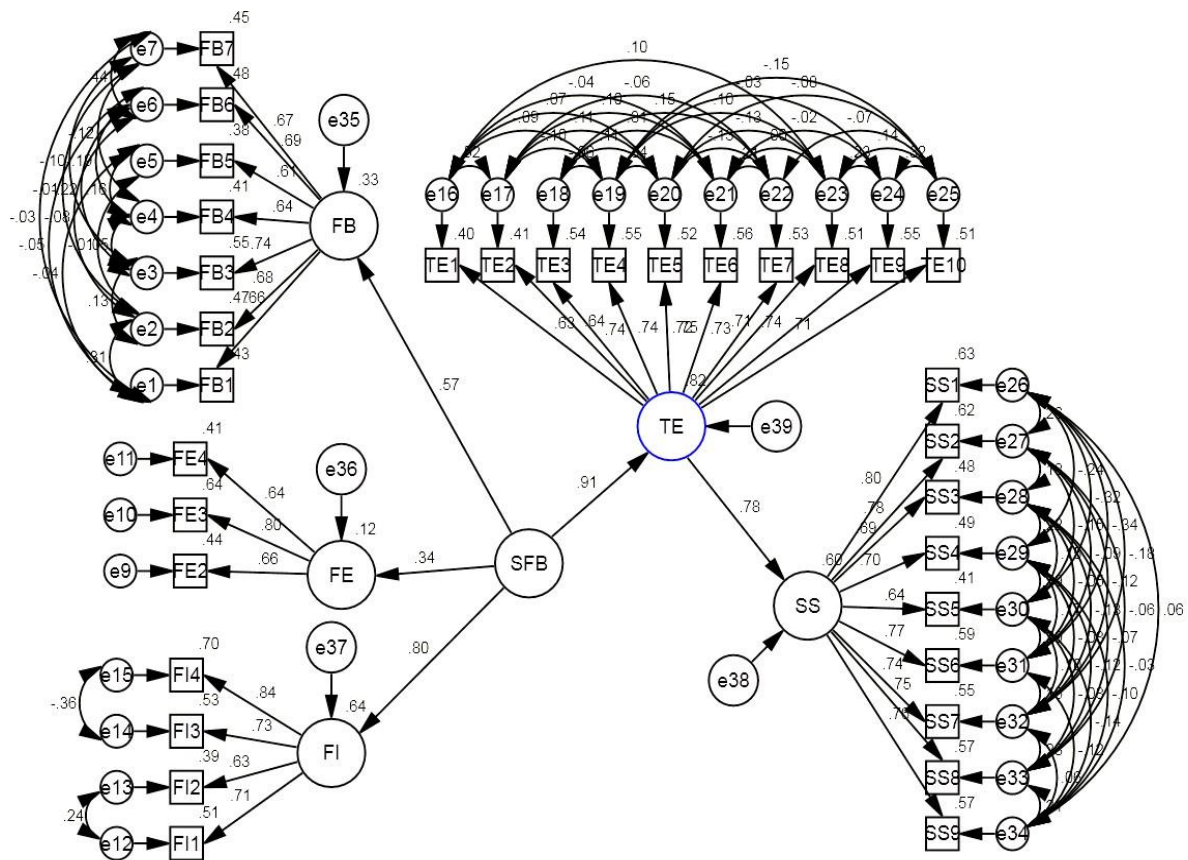


Figure No. 3 SEM Model

#### 4. Results and Discussion

The students' feedback has a significant impact on teaching effectiveness at higher education level and teaching effectiveness has a significant impact on students' satisfaction at higher education level as ( $\beta=1.553$ ,  $p$  value=0.000), Whereas, teaching effectiveness has a significant effect on students satisfaction at higher education level as ( $\beta=0.981$ ,  $p$  value=0.000). It is concluded that the results of the study indicated that both hypothesis was accepted. To respond to the said question, the first specific research objective was to determine the relationship between the students' feedback and teaching effectiveness at higher education level

In this study, it was empirically established that feedback has a significant impact on teaching effectiveness at higher education level because of ( $\beta=1.553$ ,  $p$  value=0.000). This study finding is consistent with the previous studies such as it was found that student feedback has significant impact on teaching effectiveness (Shah and Pabel 2019). The findings of a study of Zhang, Wang and Techattassanasoontorn (2018) on the importance of feedback to the management strongly support the current study. Also, Kregel (2019) results of study revealed that student feedback has positive impact on the continuous evaluation of teachers. However, Jin (2019) highlighted a

significant aspect of the students' feedback may be used with care due to different origin of the students.

In general, the gender biasness there is discrimination in male and female ranking of teachers and some studies has indicated a shift of voluntary to mandatory feedback and reward for quality of teaching. In another study findings are significant with results of current study regarding value to students' feedback with quality of teaching (Isa, & Yusoff, 2015). Similarly, the study results are highly significant and correlated with the teachers' assessment for teaching effectiveness, (Rodríguez, Gómez & Guardiola 2019).

To respond to the said question, the second specific research objective was to determine the relationship between teaching effectiveness and students' satisfaction at higher education level. The research findings revealed that teaching effectiveness has a significant impact on students' satisfaction at higher education level as ( $\beta=0.981$ ,  $p$  value=0.000), it is concluded that the results of the hypothesis are supported. The results of Shea and Parayitam (2019) research study on teaching effectiveness and graduate students' satisfaction confirmed that there is also significant impact of teaching effectiveness on students' satisfaction. Similarly, the findings of Podolsky, Kini and Hammond and Bishop (2019) revealed that teaching effectiveness is positively associated with teaching effectiveness and students' satisfaction. Anggraini (2020) conducted study on academic delivery and level of students' satisfaction. The results are highly consistent with present study there is a strong and positive relationship between university reputation, teaching quality and

student satisfaction. Furthermore, the study of Zaineldeen, Hongbo and Ibrahim (2020) also proved that there is strong relationship between academic qualities with students' satisfaction. The finding of Appuhamilage and Torii (2019) also confirms that students' satisfaction is directly linked with quality of academic and service. Antony, Karamperidis, Antony and Cudney (2019) evaluated the factors that influencing teaching effectiveness for the students' satisfaction the results are in line with the present study. Also, the findings of research study on the effect of service quality on graduates' satisfaction are associated with the current study (Sharabati, Alhileh and Abusaimh 2019). Similarly, Kashif and Ting (2014) conducted research on business students' expectations of effective teaching the results are fairly significant for the maintenance of teaching effectiveness and students' satisfaction at the higher education institutions in Pakistan. Furthermore, Students, expect that teachers should have good personality, cooperative, friendly attitude, polite and approachable inside and outside classroom for the teaching excellence and students' satisfaction. Correspondingly, Malik, Hassan, and Iqbal (2012) and Butt and Rehman (2010) research study results are highly consistent and positively correlated with the current study. The study of Cooper (2019) has shown serious concern over the lack of funds to provide required resources to the faculty for maintaining teaching effectiveness and students' satisfaction. Maamari and Majdalani (2018) findings are also aligned with the present research. Such as highly emotionally intelligent teachers enhance emotional intelligence of the

students, through classroom interaction which causes students satisfaction.

In this study, it was also empirically established that teaching effectiveness has a significant impact on students' satisfaction at higher education level as ( $\beta=0.981$ ,  $p$  value=0.000). This finding is consistent with the previous studies such as quality teaching is highly related with student satisfaction (Kitcharoen, 2004). Another study result is also significant with quality of teaching and student's satisfaction (Akbar & Parvez 2009). Furthermore, the findings of current study are also highly significant with the quality of teaching and student satisfaction (Mattah, Kwarteng & Mensah 2018). The study results of Hanssen and Solvoll (2015) are relevant with academic facilities and student's satisfaction. The findings of another study indicated that inadequate teaching quality has hampered the students' satisfaction. The results are highly significant with the teaching effectiveness and students' satisfaction (Isa & Yusoff, 2015; Kara et al., 2016). In some studies, it was found that the students felt dissatisfied with the teachers' teaching quality (Hill et al., 2003; Garcí'a-Aracil, 2009; Miliszewska & Sztendur, 2010). According to Ramsden, (1991) students were satisfied with the quality of teaching at higher education level

#### **(i) Conclusions and Recommendations**

It was concluded that student feedback is valid, consistent, and reliable; it has significant impact upon the teaching effectiveness and students' satisfaction. Therefore, it is highly recommended that student's feedback may be given due weightage and their observations may be

addressed for the students' satisfaction. Faculty must consider student feedback positive, identified weak areas must be addressed for the professional development and self-grooming and student's satisfaction. Head of the departments must initiate counseling with the faculty and share student feedback results regularly and timely to overcome weak areas. The management of universities should use student feedback for hiring, firing, promotion, and professional development of teachers. It is recommended that accredited bodies should give due consideration to the student feedback during their visits to the HEIs for the accreditation of programs. Policymakers should rethink to devise students' feedback process in consultation with the students, Teachers, HODs and QEC Directors to strengthen the Q.A mechanism.

#### **5 Limitations and directions for future research**

The current study was carried out in selected engineering universities of the province of Sindh- Pakistan and it was purely quantitative in nature. The study was based on the student perspective related to feedback, teaching effectiveness and satisfaction. Qualitative study, the mediation and moderation in quantitative study were not the scope of this study.

This study was delimited to the undergraduate students at engineering universities of Sindh. However, future studies may replicate the study variables in other provinces of Pakistan and the results may be compared. This study investigated only four engineering programs of the university; future research studies may select all programs of the universities. The future

research could be carried in multidiscipline to examine the perceptions of teachers and administrators of the universities of Pakistan.

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