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"Impact of Outcome Based Education on teaching performance at higher education level in Pakistan"

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Introduction

Outcome Based Education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience, teachers enable each student to achieve the predefined goal. There is no single specified style of teaching or assessment in OBE, instead lectures, learning opportunities, and assessment methods are designed and implementedto help students achieve the specified outcomes. Outcome based assessments enable teachers to practically demonstrate the prospective learning for students. This is considered highly beneficial and supportive for students at higher education in developing their portfolios, which serve as evidences of gained learning to further enhance academic as well as professional pursuits. Enhancing teaching standards and academic performances are important strategic goals for any university or institute that offers higher education, specifically in context of Pakistan with presence of relatively fewer universities and higher population growth. It is important to analyze if outcome based education and outcome based assessment support Pakistani university or higher education teachers in enhancing their performance and academic standards.

Rational of Study

This study aims to explore perspectives of teachers and prospective educationists about significant attributes and factors relating Outcome Based Education (OBE), its general awareness, institutional commitment towards implementing Outcome Based Education (OBE), learning and teaching practices in OBE, and processes prevailing about its assessment and measurement in both public and private higher education institutions of Pakistan.

Problem Statement

The current Pakistani education system faces lots of challenges in terms of its quality and perceived value. A comparison to contemporary global educational practices further elaborates the lack of innovation and creativity especially at higher education level. The teaching methodologies and assessment practices are also allured, which is evident from the general performance of graduates being produced by universities in Pakistan. Their acceptability in international markets are ranked very low and they even have to struggle to avail employment opportunities locally. Part of the problem is linked with lower economic progress of country, resulting in lesser job openings and higher unemployment and the other half, which comes in domain of education providers, surrounds the quality of graduates being produced. This is directly related to the input given by the institutional management and academic processes, teaching and learning methodologies and assessment & measurement mechanisms employed by teachers in universities and institutes of higher education.
Outcome Based Education (OBE) promises to improve not only the potential performance of students since its main focus is to ensure the attainment of required competency level by students, but it also enhances the performance of teachers by raising the academic and assessment processes in a logical and rational order. This research study is an attemptto understand the significant attributes of application of Outcome Based Education at higher education level in Pakistan. It aims to understand and explore the impact of Outcome Based Education (OBE) on teaching performance and academic standards at higher education level in Pakistan.

Research Objectives

Following are the research objectives of this study:

- To identify prospective and existing teachers perspectives on Outcome Based Education (OBE)
- To examine the presence and perception on general awareness about OBE
- To examine the advantages of adopting OBE and the required level of commitment at higher education level

- To discover the potential and actual challenges that OBE could face in relation to learning and teaching practices and processes
- To study the implementation of OBE assessment and measurement at higher education level

Significance of study

The study is highly significant in the current context of Pakistan where fewer universities in public and private sector strive to cater higher educational needs of a highly emergence young population in the country. The higher rates of unemployment among greater number of university graduates puts serious questions on the quality of teaching and assessment processes in universities. One observation is, we have evolved as a society which is not producing graduates with pragmatic skills and practical approaches to deal with real life and workplace issues. We rather trainstudents in class rooms to prepare merely for passing the university exams and earn the degrees. Although, the traditional assessment practices help somehow in learning the theoretical concepts but the absence of practical skills assessment asrequired by industry including the required level of knowledge, skills and attitude remains an unanswered question by most university management and teachers. Despite the multiple benefits and advantages of Outcome Based Education and Assessment, it is vitally significant to understand and contextualize these as per our local needs and requirements. It is interesting to investigate the issue against the contemporary teaching and assessment practices in Pakistani universities, both in public and private sectors. It shall further highlight impact of the relationship between Outcome Based Education (OBE) and teaching performance& academic standards, in Lahore based public and private sector universities and institutions offering higher education. The study also promises to provide opportunities for further investigation to endorse better assessment practices at higher education with respect to specific subjects' planning and decisions on their potential output for industry, with most suitable teaching and learning practices.

Research Questions

- What is the current status and general awareness level about OBE at higher education institutions?
- What factors might contribute in enhancing institutional and teachers' commitment towards OBE?
- What are potential gains in learning and teaching practices in line with OBE at higher education institutions in Pakistan?
- What implications arise from the perceptions of teachers on assessment and measurement mechanisms and practices of OBE?

Literature Review

Outcome Based Education means clearly focusing and organizing everything in an educational system around what is relevant and essential for students to be able to do successfully at the end of their learning experiences (Spady, 1994). Concept of Outcome Based Education (OBE) canbe comprehensively understood but to define it is somewhat difficult. The term "outcome" needs to be fully understoodin order to operate and execute OBE. The demonstration that students perform at the end of a substantial learning experience or activity to produce the learning results are outcomes. These are not their intuitions, attitudes, moral, values or states of mind but are the actions that students demonstrate as result of knowledge they have been given and the tangible submission of what they have learned in a specified time period. This means outcomes are actions and demonstrations that express and reflect students' capability in utilizing content, data, thoughts, information and ideas in an effective manner. The curriculum in OBE is developed on basis ofexpected results produced by the outcomes, the students display at the end of a given time frame or a semester. We can summarize OBE as 'result orientated' system in which the focus is on the process of education rather than ultimate results. All course outcomes are clearly predefined against which the students are assessed in OBE. A major benefit of predefined outcomes is the teaching methods, procedures for assessment, strategies used in teaching and learning, and the overall educational environment are allmade compatible with the stated learning outcomes. This enables allrelevant stakeholders (including students, teachers, parents, employers and institute management)are on board and are not only familiar with stated learning outcomes during the whole learning process but they are clear on how the course contributes towards the defined learning outcomes through study guides and multiple channels. OBEdominantly contributes to signifyingthe essential items inany curriculum, and allows educationists to redesign, adjust, amend and plan contents of curriculum with clarity of its future utility. In outcome-based education, product defines the process (Harden, Crosby and Davis, 1999). It also anticipate students to abide by the procedures, characterized in the outcome statement. Students are made conscious to incorporate these procedures directlythrough demonstration of their work. Subsequently, one key element for perceiving a well-

definedlearning outcome is to identify appropriate demonstration words or action words that should reflect procedures on which the student is relied upon in order to accomplish the task. The absence of these appropriate action words would result in outcome statements lackingclarity of required demonstration process, and without that process the outcome statement perceives the character of an objective instead of a genuine outcome demonstration. Another major component of Outcome Based Education is competency that a student must possess and demonstrate to pass a course. The transformation of production based economy to knowledge based economy has fundamentally affected the nature of work and opportunities in employment. Competence in information handling and data processing is already a leading edge in most jobs today. Over the past four decades there have been several precursors to this move foreffective outcome-based education. These include competence-based education, criterion-referenced learning and mastery learning, which focus on competences or criterion levels of performance (Harden, 2002). Students are required to achieve all course outcomes in order to clear the course, and that too in specified timeframe, using specified procedures and activities. This makes OBE more interesting both students as well as teachers since it gives freedom and flexibility in ways to achieve these outcomes but in a restricted boundary, which creates good space for creativity, innovation and out of box thinking.

Research hypothesis

- There is a connection between Outcome Based Education and teaching standards at higher education level in Pakistan.
- There is no connection between OBE and teaching standards and academic performance at higher education providers

Methodology

This section explains the research methodology including Research approach, Rationale, Data collection methods, Instrument, Population, Sample, Reliability and Validity of the research.

Research Design

The research study is executed tofindourwhetherthereisaclear indication of enhanced teaching performances by implementingOutcome Based Education at higher education level, on basis of gender, qualification, experience, discipline and type of institutesin public or private sector. The quantitative research approach has been employed to serve the purpose since itsupportsdatacollectionand analysisas well as in investigatingrelationship between the chosen variables.

Rationale for choosingQuantitative Method

The major reason to choose quantitative method in this research study implies the fact thatexisting and prospective teachers' point of view is critically important for any further application of this study as Renwick et al., 2013 state that quantitative is an approach which is used to collect the data from primary sources and then describe and analyze the data in a measurable way. Quantitative data analysis iswidely known to be used forexplaining chosen variablesand for studying comparison between groups of these variables. This method promises to bevery supportive in finding out and measuring existing and prospective teachers'perceptions.

Data collection methods: Primary sources

Questionnaire has been taken as the major instrument for data collection andanalysis. The reason for this choice of primary data collection remains that itsupports the articulation of variety of sources from different higher education institutes, located in Lahore city of Pakistan.

Questionnaires as instrument

The instrument for quantitative research was adopted from a published study by Kauthar a Rhaffor at University of Kuala Lumpur (Rhaffor, 2017). It is based on five sections on like rt scale. Section 1 covers demographic information, section 2 focuses on general awareness on OBE, section 3 explores commitment towards OBE for implementation in any institute, section 4 relates to learning and teaching practices and the last section focuses on assessment and measurement in OBE.

Population

Our population for quantitative approach include existing and prospective teachers in the higher educational sector of Pakistan.Thedatawascollectedfromdifferent universities and institutes who are either

already executing OBE, or these are potential adopters of OBE. The data was collected from both male and female participants with the age bracket ranging between 22-60years.

Sample

It is impractical to investigate the whole population to obtain useful and valid information about the population. Sampling is a method to reduce the number of individuals or entities of a population under investigation. As long as the entities included in the sample genuinely represent the population, the result obtained will symbolize the whole population. The sampling technique used in this research is convenience sampling. We used this availability sampling technique in which data was collected from existing and prospective teachers on basis of convenience and simplicity. Probabilitysamplingwas not used for the fact that complete information and list of teachers was not accessible.

As planned, hundred current or prospective teachers who are either currently working with public or private universities / institutes in Lahore, Pakistan or they shall initiate their career in teaching at university level, were engaged to undergo this study. A comprehensive instrument was distributed to get their opinion and feedback. This helped in getting the perspectives from these participants for understanding the issue and suggesting possible recommendations.

Participants Selection

The eligible participants for this research included universities, colleges and institutes offering higher education in Lahore city of Pakistan. A total of hundred participants, who are either already practicing teachers orthey are prospective in the field, fresh as well as professionally experienced, were engaged. The researcher's intention was to select organizations which have either already adopted OBE, or these are potential adopters of OBE.

Ethical Considerations

The researcher conducted quantitative means of data collection, which was survey. All participants were provided with research information and their consent was obtained prior to their involvement in there search study. Participants were assured about significant ethical considerations before getting them the questionnaires. Any participating organization name, and survey respondent names have not been mentioned anywhere in the research.

Analysis

Quantitative Analysis

This section presents the research data obtained from the survey comprising hundred participants from both public and private sector educational institutes of Lahore. SPSS software has been used for interpretation of results, analyzing descriptive frequencies, histogram and reliability.

Computed variables have been used for analysis purposes in the following order:

Variable Section	**Compute Variable**	**Relationship**
Section 2 of survey: General Awareness on Outcome Based Education (OBE) in your University/Institute	GAt	Independent
Section 3 of survey: Commitment towards Outcome Based Education (OBE) Implementation in your University/Institute.	CTL	Dependent
Section 4 of survey: Learning and Teaching in Outcome Based Education (OBE).	LTL	Dependent
Section 5 of survey: Assessment and Measurement in Outcome Based Education (OBE).	AMT	Dependent

Table 1:Reliability Test
Reliability statistics of complete scale

Reliability Statistics

Cronbach's Alpha	N of Items
.945	33

Reliability Analysis subscales

Variables	Cronbach's Alpha	N of Items
GAt	.756	7
CTL	.801	5
LTL	.909	8
AMT	.942	13

Interpretation

The above data lists the reliability of overall variables and individual variables. The overall reliability of the test is 0.945 which shows excellent reliability with number of items at 33. This allows us to accept the first hypothesis. There is a connection between Outcome Based Education and teaching standards at higher education level in Pakistan. The second hypothesis is rejected.

Frequencies

Frequencies Distribution is used to find out frequencies of the options available to the respondents.

Table 2: Gender
Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	45	45.0	45.0	45.0
	Female	55	55.0	55.0	100.0
	Total	100	100.0	100.0	

Interpretation

This frequency table shows the total number of respondents i.e.100 respondents. The first column shows the frequency of respondents in relation to the identified gender; Male and Female respondents, who are placed in the ascending rows.

From the table above we can clearly access that 55% of the respondents were females, who are 10% more in number than the 45% of male respondents.

Table 3: Qualification ofRespondents

Qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vocational/Technical Diploma	12	12.0	12.0	12.0
	Undergraduate	50	50.0	50.0	62.0
	Post-graduate	38	38.0	38.0	100.0
	Total	100	100.0	100.0	

Interpretation:

This table displays the qualification levels of respondents. 12% of the respondents hold a vocational or technical diploma, 50% holdan undergraduate degree and 38% hold a postgraduate degree. The information clearly states that nearly half of the respondents hold undergraduate degree at 50% and 38% possess advanced degreesand the minimum level of qualifications were diploma holders.

Table 4: Experience of Respondents

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Prospective Teacher	20	20.0	20.0	20.0
	0-2	23	23.0	23.0	43.0
	2-5	33	33.0	33.0	76.0
	5 and above	24	24.0	24.0	100.0
	Total	100	100.0	100.0	

Interpretation:

Table4showsthe number of years of working experience with additional to prospective respondents who want to start their career in the education sector after completion of their studies. The data shows that respondents with working experience of 5 years and above were 24%, followed by respondents with years of experience between 2 to 5 years at 33%, 23% of respondents fall between fresh graduates until 2 years of experience. An interesting data of 20% of the respondents, who are prospective teachers intend to join the profession after completing their education. The datashows number of teachers with experience between 2 to 5 years is the highest, whereas the number of teachers fall after 5 years of experience, which can be due to change in nature of job or up-gradation to an administrative position.

Table 5: Discipline

Discipline

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Social Sciences	8	8.0	8.0	8.0
	Science & Engineering	12	12.0	12.0	20.0
	Business & Economics	19	19.0	19.0	39.0
	Computer Sciences	5	5.0	5.0	44.0
	Art & Humanities	49	49.0	49.0	93.0
	Other	7	7.0	7.0	100.0
	Total	100	100.0	100.0	

Interpretation:
Table 5 shows the discipline of respondents regarding their qualifications. It reveals that majority of background of respondents is in Arts &Humanities at 49%, which is quite high comparing to next alternative at 19% which is Business and Economics.

Table 6: University type

University

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public	40	40.0	40.0	40.0
	Private	60	60.0	60.0	100.0
	Total	100	100.0	100.0	

Interpretation:
Table 6 concludes that majority of the respondents obtain their qualifications from a private university or institute of higher education at 60% comparing to 40% of Public Universities counterparts.

Table 7: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
GAt	100	1.00	2.00	1.2486	.27960
CTL	100	1.20	5.00	3.5660	.73803
LTL	99	1.63	5.00	3.7336	.76944
AMT	100	1.62	5.00	3.6815	.75922
Valid N (listwise)	99				

Interpretation:
The above table represents basic descriptive statistics to be acceptable and in significance range which includes minimum and maximum value with mean and standard deviation.

Discussion

The research study aims to explore the prospective as well as existing teachers at institutes and universities which offer higher education and where Outcome Based Education is either operating or potential in future.

The major finding from this research study highlights the significant need of a higher level of awareness about OBE. It is evident that most respondents are not fully aware of the general conceptualization and utility of Outcome Based Education. Lack of in depth understanding of this system has mainly affected all other sections of the survey. We can consider General Awareness to be an independent variable and other sections including Commitment towards OBE, Learning and teaching practices section as well as the Assessments and Measurement section seem depending on it and these are therefore, dependent variables. It is also implied that respondents who tend to be younger in age are more inclined towards practical and action oriented teaching that enable learners to be preparing for industry in more pragmatic manner, whereas teachers who are more experienced want to stick to old systems. Resistance to a relatively newer approach to teach stays higher with those who have repeatedly followed the traditional teaching and learning methods. The same applies for conducting and practicing the assessment and measurement strategies being followed by teachers. OBE demands the contextualization of theory and knowledge being imparted unlike the traditional systems which most of times, is too generic in its usage and delivery.

The finding of the study also showsthe tendency of agreement among majority of respondents towards favoring OBE to be a tool that could enhance the teaching performances and academic standards at higher education level in universities. Out of box approaches towards assessment and measurement practices under OBE has appealed but it is subjected to the adequate level of required general and specific awareness and exposure about OBE.

A strong parenting of universities' administration and related government agencies at macro level could greatly impact the adoption process of OBE. Benchmarking could be drawn to study the impact of adopting OBE from other universities and institutes of higher education with similar cultural context if not from mature and develop part of world.

The vocational education fraternity, perhaps, has the most burden to carry since these are primarily

oriented with practical and action oriented learning. The performance of private sector institutes reflect a slightly better understanding as well as implementation in comparison to their counterparts in public sector who are more rigid in their approaches. The less productive bureaucratic systems, slower work mechanisms, lesser accountability, lesser fear of competition that could result in lesser financial profits or gains could explain the issue as well.

The weaker link between industry (potential buyers) and institutions (suppliers) also stays in the list of factors that prevent flourishing OBE and approaches alike.

The research study vitally explains the extremely important relationship between the first section of survey, i.e. general awareness on OBE with all others. It implies, the more awareness created, the better are potentials for OBE to create future commitment from teachers, their improved performances in teaching and learning, and also leading to further competitive assessment and measurement mechanisms.

Limitations

- There weremanyprominentorganizations, higher education institutes and universities both in the public and private sector, which didnot allowconductingthe data from theiremployees.
- Thesamplewasnotlargeenoughtogeneralizetheresearchto otherprovinces and even cities other than Lahorein Pakistan.
- Theparent questionnairewasnotdevelopedinPakistanicontext,which contribute minimally to shortcomingsofthisresearch.
- Thestudycannotbegeneralizedbecauseitwasconductedona small scale and capturedonlyjust onecity of Pakistan.
- Time factor remained the biggest constraint. Summer vacations in universities and institutions did not enable to include larger variety of institutions and respondents.

Future recommendations

New dimensions of teachers' perceptions and administration / managerial prospective can be added to explore more about this phenomenon for future prospects. Data could be used in a comparative analysis of public and private organizations to compare location and industry, along with financial remunerations or any other perks being given to teachers. Further research may add the perspectives and perceptions of students on OBE. Thiscould add more value for future directions since students are an extremely important stakeholder. Perspectives from industry can also be added to evaluate what potential employers seek from graduating students in terms of their knowledge, skills, attitude and understanding on subject of specialization and if OBE meets their expectations from education providers.

References

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Appendix1.1 Questionnaire

Outcome Based Education (OBE) Questionnaire

Dear Participant,

Outcome-based education (OBE) is an educational theory that bases each part of an educational system around goals (outcomes). By the end of the educational experience, each student should have achieved the goal. There is no single specified style of teaching or assessment in OBE; instead, classes, opportunities, and assessments all help students to achieve the specified outcomes. Outcome-based assessment enable students to practically demonstrate their learning.

You are incited to participate in a survey about OBE system in higher education. Here, we would like to ensure you, that the information/feedback provided by you will be kept confidential and will only be utilized for the study/research purpose.

Section 1. Demographic Information

1. Gender: ( ) Male ( ) Female

2. Qualifications:
( ) Vocational/Technical Diploma ( ) Bachelor ( ) Post-graduate ( ) Doctorate

3. Experience in Outcome Based Education (OBE)
( ) 0-2 years ( ) 2-4 years ( ) 4-6 years ( ) More than 6 years

4. Discipline:
( ) Social Sciences ( ) Science & Engineering ( ) Business & Economics ( ) Computer Sciences
( ) Arts & Humanities ( ) Other

5. University/Institute:
( ) Public ( ) Private

General Awareness on Outcome Based Education (OBE) in your University/Institute

Please rate how true each statement is for you by encircling one option against each statement.

Sr.	Statements	Yes	No
1.	I am aware that my University/Institute is implementing Outcome Based Education (OBE) which focuses on students' achievement.	1	2
2.	I am aware of my University/Institute Programmes Educational Objectives (PEOs).	1	2
3.	I am aware of my University/Institute Programmes Learning Outcomes (PLOs).	1	2
4.	I am aware of the methods used to measure Programmes Educational Objectives (PEOs).	1	2
5.	I am aware of the methods used to measure Programmes Learning Outcomes (PLOs).	1	2
6.	I am aware of the methods used to measure Course Learning Outcomes (CLOs).	1	2
7.	I am aware of the learning domains (cognitive, affective and psychomotor) specified to each CLOs for all courses I attended.	1	2

Commitment towards Outcome Based Education (OBE) Implementation in your University/Institute.

Please encircle the appropriate option against each statement.

Sr.	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Teachers are briefed on Outcome Based Education (OBE) approach during Orientation Week (prior to course commencement).	**1**	**2**	**3**	**4**	**5**
2.	Teachers are explained the Course Learning Outcomes (CLOs) of the courses (prior to course commencement).	**1**	**2**	**3**	**4**	**5**
3.	Information on OBE is accessible to everyone in my University/Institute.	**1**	**2**	**3**	**4**	**5**
4.	Teachers put efforts to improve their teaching methods for effective OBE system.	**1**	**2**	**3**	**4**	**5**
5.	Teachers work hard to ensure all students attain the learning outcomes of their courses.	**1**	**2**	**3**	**4**	**5**

Learning and Teaching in Outcome Based Education (OBE).

Please encircle the appropriate option against each statement.

Sr.	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I believe that understanding the Course Learning Outcomes (CLOs) help me to do better in my assessments.	**1**	**2**	**3**	**4**	**5**
2.	I am aware of the assessment criteria being used to assess students in class.	**1**	**2**	**3**	**4**	**5**
3.	I understand the relationship between assessments (quizzes, tests, practical, assignment, final exam, etc.) and the attainment of learning outcomes.	**1**	**2**	**3**	**4**	**5**
4.	Students are encouraged to think independently in solving problems and self-managed learning in OBE system.	**1**	**2**	**3**	**4**	**5**
5.	Students have the opportunity to demonstrate their communication skills during classes.	**1**	**2**	**3**	**4**	**5**
6.	Students debate, discuss and reflect in the class by their own judgment and interpretation.	**1**	**2**	**3**	**4**	**5**
7.	The teaching methods enhance students' critical thinking skills in OBE system.	**1**	**2**	**3**	**4**	**5**
8.	Students are exposed to the case studies or real practice in industries in the class learning and teaching activities in OBE system.	**1**	**2**	**3**	**4**	**5**

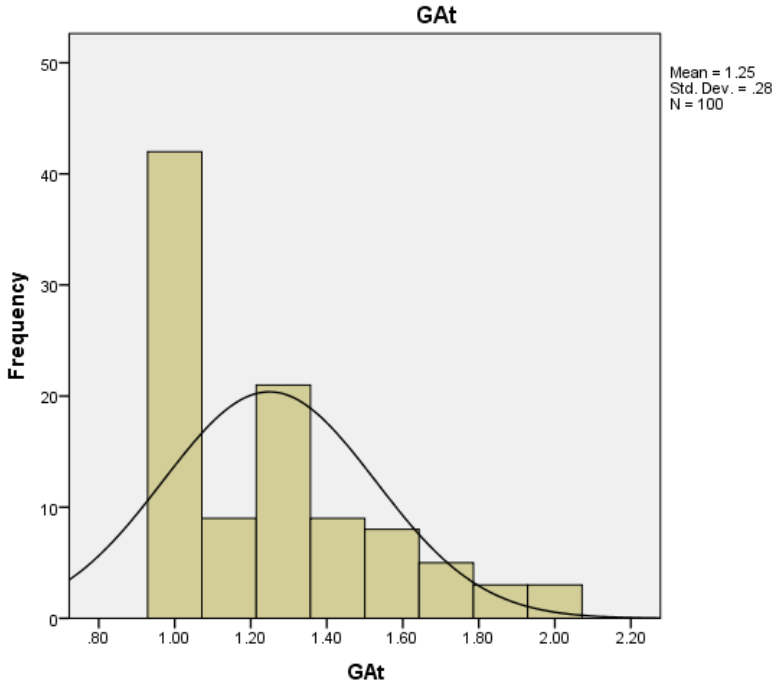
Assessment and Measurement in Outcome Based Education (OBE).

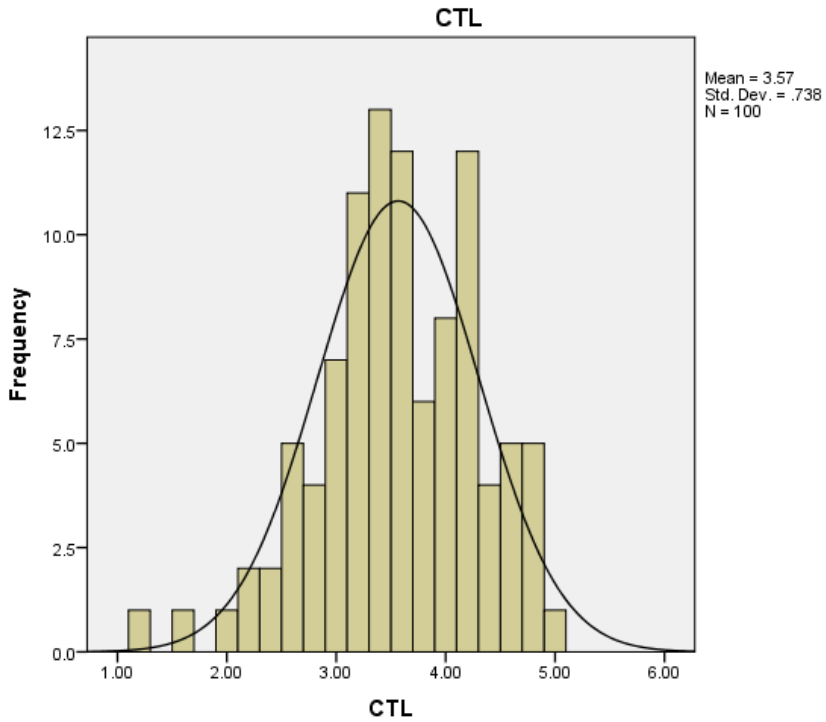
Please encircle the frequency of each statement according to the given options.

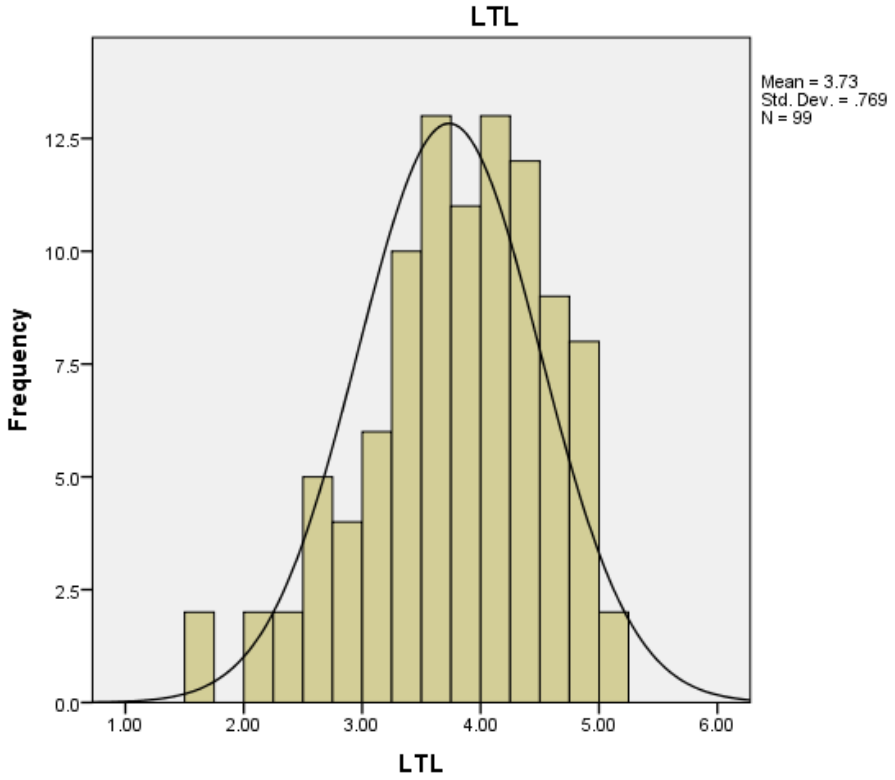
Sr.	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	The stated learning outcomes for every course have a valuable relationship with their assessments.	**1**	**2**	**3**	**4**	**5**

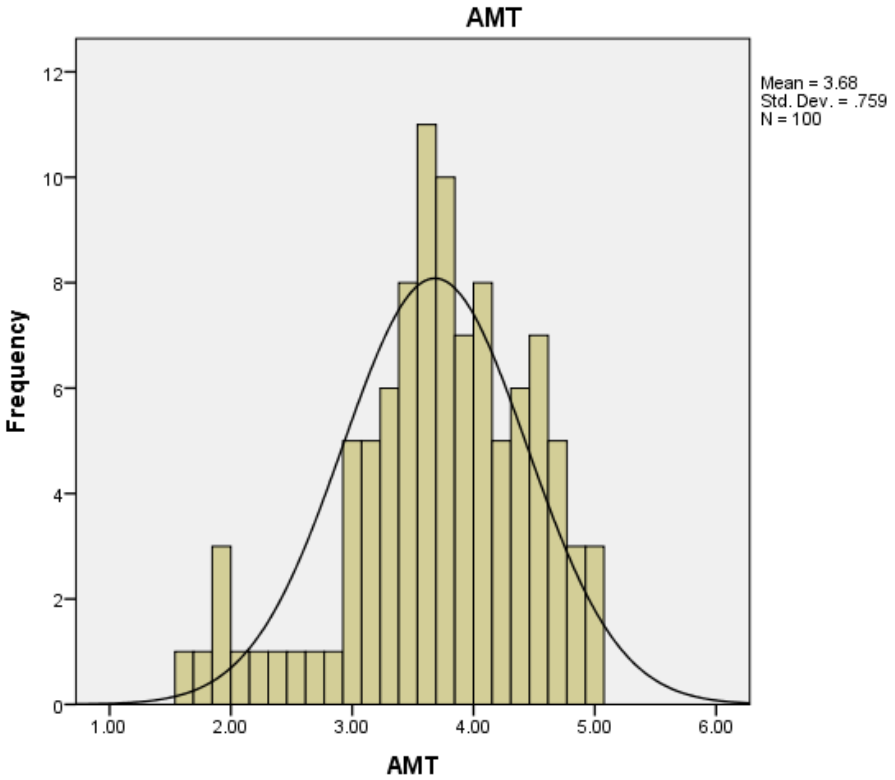
2.	Class room activities have a clear relationship with course assessment.	**1**	**2**	**3**	**4**	**5**
3.	The stated learning outcomes are clear and understandable to students for completing their tasks/assignments.	**1**	**2**	**3**	**4**	**5**
4.	The stated learning outcomes are clear and understandable for teachers to assess and measure students' performances.	**1**	**2**	**3**	**4**	**5**
5.	Assessment techniques for any course is aligned with stated learning outcomes.	**1**	**2**	**3**	**4**	**5**
6.	Assessment practices contribute to students' achievements throughout the courses.	**1**	**2**	**3**	**4**	**5**
7.	Assessment and measurement activities are well prepared and executed by teachers.	**1**	**2**	**3**	**4**	**5**
8.	Assessment tasks are fair and appropriate for students.	**1**	**2**	**3**	**4**	**5**
9.	Assessments enable students to achieve the stated course learning outcomes.	**1**	**2**	**3**	**4**	**5**
10.	Assessment workload on students is reasonable throughout the course.	**1**	**2**	**3**	**4**	**5**
11.	Students enjoy doing assessments in Outcome Based Education (OBE) programmes.	**1**	**2**	**3**	**4**	**5**
12.	Teachers enjoy conducting assessments in Outcome Based Education (OBE) programmes.	**1**	**2**	**3**	**4**	**5**
13.	OBE gives opportunity to teachers for thinking out of box and conducting non-traditional/innovative assessments.	**1**	**2**	**3**	**4**	**5**

Appendix1.2Histograms






LTL
Mean = 3.73
Std. Dev. = .769
N = 99
Frequency
12.5
10.0
7.5
5.0
2.5
0.0
1.00
2.00
3.00
4.00
5.00
6.00
LTL


AMT
Mean = 3.68
Std. Dev. = .759
N = 100
Frequency
12
10
8
6
4
2
0
1.00
2.00
3.00
4.00
5.00
6.00
AMT

Appendix1.3 Tables

Table 8: Frequency of GAt

GAt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	42	42.0	42.0	42.0
	1.14	9	9.0	9.0	51.0
	1.29	21	21.0	21.0	72.0
	1.43	9	9.0	9.0	81.0
	1.57	8	8.0	8.0	89.0
	1.71	5	5.0	5.0	94.0
	1.86	3	3.0	3.0	97.0
	2.00	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

Table 9: Frequency of CTL

CTL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.20	1	1.0	1.0	1.0
	1.60	1	1.0	1.0	2.0
	2.00	1	1.0	1.0	3.0
	2.20	2	2.0	2.0	5.0
	2.40	2	2.0	2.0	7.0
	2.60	5	5.0	5.0	12.0
	2.80	4	4.0	4.0	16.0
	3.00	7	7.0	7.0	23.0
	3.20	11	11.0	11.0	34.0
	3.40	13	13.0	13.0	47.0
	3.60	12	12.0	12.0	59.0
	3.80	6	6.0	6.0	65.0
	4.00	8	8.0	8.0	73.0
	4.20	12	12.0	12.0	85.0
	4.40	4	4.0	4.0	89.0
	4.60	5	5.0	5.0	94.0
	4.80	5	5.0	5.0	99.0
	5.00	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

Table 10: Frequency of LTL

LTL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.63	2	2.0	2.0	2.0
	2.00	1	1.0	1.0	3.0
	2.13	1	1.0	1.0	4.0
	2.25	1	1.0	1.0	5.1
	2.38	1	1.0	1.0	6.1
	2.50	4	4.0	4.0	10.1
	2.63	1	1.0	1.0	11.1

	2.75	1	1.0	1.0	12.1
	2.88	3	3.0	3.0	15.2
	3.00	3	3.0	3.0	18.2
	3.13	3	3.0	3.0	21.2
	3.25	5	5.0	5.1	26.3
	3.38	5	5.0	5.1	31.3
	3.50	8	8.0	8.1	39.4
	3.63	5	5.0	5.1	44.4
	3.75	5	5.0	5.1	49.5
	3.88	6	6.0	6.1	55.6
	4.00	7	7.0	7.1	62.6
	4.13	6	6.0	6.1	68.7
	4.25	4	4.0	4.0	72.7
	4.38	8	8.0	8.1	80.8
	4.50	4	4.0	4.0	84.8
	4.63	5	5.0	5.1	89.9
	4.75	7	7.0	7.1	97.0
	4.88	1	1.0	1.0	98.0
	5.00	2	2.0	2.0	100.0
	Total	99	99.0	100.0	
Missing	System	1	1.0		
Total		100	100.0		

Table 10: Frequency of LTL

AMT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.62	1	1.0	1.0	1.0
	1.77	1	1.0	1.0	2.0
	1.85	1	1.0	1.0	3.0
	1.92	2	2.0	2.0	5.0
	2.08	1	1.0	1.0	6.0
	2.15	1	1.0	1.0	7.0
	2.38	1	1.0	1.0	8.0
	2.46	1	1.0	1.0	9.0
	2.62	1	1.0	1.0	10.0
	2.77	1	1.0	1.0	11.0
	2.92	2	2.0	2.0	13.0
	3.00	3	3.0	3.0	16.0
	3.08	2	2.0	2.0	18.0
	3.15	3	3.0	3.0	21.0
	3.23	2	2.0	2.0	23.0
	3.31	4	4.0	4.0	27.0
	3.38	5	5.0	5.0	32.0
	3.46	3	3.0	3.0	35.0
	3.54	10	10.0	10.0	45.0
	3.62	1	1.0	1.0	46.0
	3.69	5	5.0	5.0	51.0
	3.77	5	5.0	5.0	56.0

3.85	2	2.0	2.0	58.0
3.92	5	5.0	5.0	63.0
4.00	4	4.0	4.0	67.0
4.08	4	4.0	4.0	71.0
4.15	1	1.0	1.0	72.0
4.23	4	4.0	4.0	76.0
4.31	2	2.0	2.0	78.0
4.38	4	4.0	4.0	82.0
4.46	4	4.0	4.0	86.0
4.54	3	3.0	3.0	89.0
4.62	4	4.0	4.0	93.0
4.69	1	1.0	1.0	94.0
4.77	1	1.0	1.0	95.0
4.85	2	2.0	2.0	97.0
4.92	1	1.0	1.0	98.0
5.00	2	2.0	2.0	100.0
Total	100	100.0	100.0	