

Outcome-based Education System and Their Mediating Role in Quality of Tertiary Education in Bangladesh

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Abstract

Outcome-Based Education (OBE) has gained significant attention in recent years as an effective approach to improving the quality of higher education by focusing on clearly defined learning outcomes, student-centered teaching, and continuous assessment. This study aims to explore the key determinants of the Outcome-Based Education system and examine their mediating role in enhancing the quality of education at the tertiary level in Bangladesh. The research identifies several important determinants, including effective OBE curriculum design, institutional support, faculty competency, assessment and evaluation systems, and the practical execution of OBE principles. The study employed a quantitative research methodology which collected primary data through a structured questionnaire from participants who included students and faculty members and academic administrators and coordinators from public and private universities. The study applied a sampling technique which enabled researchers to gather responses from multiple stakeholder groups who would provide valuable insights into how OBE programs are currently being implemented throughout Bangladesh. The study results demonstrate that the identified determinants positively affect the successful implementation of Outcome-Based Education. The research outcomes demonstrate that OBE practices function as a vital mediating factor between institutional elements and educational quality outcomes. The study found that institutional resources and support become effective when educational institutions apply OBE principles through their actual classroom practices. The challenges prevent educational institutions from experiencing the complete advantages which Outcome-Based Education gives to their students. The research contributes to existing academic research by presenting empirical evidence which establishes the elements that determine OBE implementation success in Bangladesh. The research delivers essential information to university decision makers and educators which enables them to build better OBE implementation methods for teaching improvements. The study demonstrates that universities which implement a comprehensive Outcome-Based Education system will achieve better educational results through their modern workforce training programs.

Keywords: Continuous assessment, Outcome-Based Education, student-centered teaching, tertiary level

1.1 Background of the Study

In recent decades, higher education worldwide has experienced a paradigm shift from traditional input-based teaching to outcome-based education (OBE), which emphasizes measurable learning outcomes, competencies, and skills acquisition rather than merely completing a syllabus. This shift is particularly crucial in developing countries like Bangladesh, where tertiary education institutions face challenges such as overcrowded classrooms, limited resources, and varying teaching standards. The last two decades Bangladesh have seen develop both public and private universities at a fast pace.

The expansion of higher education access has created larger educational opportunities, but it has exposed critical gaps in educational standards throughout the country. Educational institutions continue to practice traditional teaching methods which emphasize memorizing information instead of developing students' ability to think critically and solve problems and apply knowledge. The implementation of outcome-based education (OBE) in educational systems works to create common learning standards while enhancing faculty teaching methods and increasing student employability rates.

The worldwide educational community promotes outcome-based education (OBE) as a teaching method yet its usage in Bangladesh shows irregular patterns. The successful implementation of OBE depends on institutional policies and faculty training programs and curriculum design methods and student engagement activities and external accreditation requirements. The bridge between existing teaching methods and international educational standards needs an understanding of how these factors affect education quality and how OBE functions as a mediator between the two.

The study functions as an analytical tool to compare private universities with public universities because their fundamental differences create different ways of viewing their institutional resources and governance systems and student bodies. The research study investigates OBE determinants while assessing their mediation functions to develop evidence-based guidance for policy makers and university leaders and educators who need to boost higher education standards in Bangladesh. The research investigates multiple factors that determine OBE adoption while establishing links between these factors and improvements in education quality which helps advance higher education reforms in Bangladesh.

1.2 Statement of the Problem

In recent years, Outcome-Based Education (OBE) has emerged as a globally recognized approach to enhancing the quality of higher education. OBE focuses on the alignment of curriculum, teaching-learning processes, and assessment methods to achieve clearly defined learning outcomes. Several studies suggest that effective implementation of OBE can significantly improve students' competencies, employability, and overall academic performance (Spady, 1994; Harden, 2007). In the context of Bangladesh, higher education institutions are under increasing pressure to meet international standards and produce graduates equipped with skills relevant to the rapidly evolving job market. While some private universities in Bangladesh have initiated OBE frameworks, the extent of implementation and its impact on education quality remains uneven and largely unexplored. Public universities, meanwhile, often face challenges such as outdated curricula, insufficient faculty training, and lack of proper assessment mechanisms (Rahman, 2018; Ahmed & Kabir, 2020).

Previous research highlights several determinants that influence the successful adoption of OBE, including faculty competency, institutional support, curriculum design, assessment strategies, and student engagement (Kennedy, 2014; Biggs & Tang, 2011). However, studies examining the mediating role of these determinants in improving education quality at the tertiary level, specifically in Bangladesh, are limited. Most research has focused either on OBE implementation in developed countries or on the higher education system in general, without differentiating between private and public universities.

This research seeks to fill this gap by investigating how key determinants of OBE such as faculty preparedness, institutional policies, teaching methodologies, and assessment systems mediate the enhancement of educational quality in selected private and public universities in Bangladesh. Understanding these relationships is crucial for policymakers, educators, and university administrators seeking to reform curricula and teaching strategies to meet both national and international standards.

1.3 Objective of the Study

To examine the determinants of the outcome-based education system and understand how determinants mediate the improvement of education quality in tertiary-level institutions in Bangladesh. Specific objectives are that to identify the key determinants influencing the implementation of the outcome-based education system in selected public and private universities in Bangladesh; to assess the current level of education quality in these universities from the perspective of students, faculty, and administration; to analyze the relationship between the identified determinants of OBE and the overall education quality in tertiary institutions; to examine the mediating role of outcome-based education in enhancing education quality in selected universities; to compare the implementation and effectiveness of OBE systems between private and public universities in Bangladesh; To examine the determinants of the outcome-based education system and understand how these determinants mediate the improvement of education quality in tertiary-level institutions in Bangladesh. To provide recommendations for policymakers, university administrators, and educators on strengthening OBE practices to improve education quality.

1.4 Significance of the Study

The study on the determinants of outcome-based education (OBE) and their mediating role in improving education quality at the tertiary level in Bangladesh is significant for several reasons. The research study identifies crucial factors which affect OBE implementation success, and it demonstrates their direct impact on educational quality across public and private universities through its academic research. The educational authorities and policymakers can use the research results for their educational planning activities which aim to improve OBE implementation through the development of university programs that meet national and international educational standards. University administrators and faculty can apply the research results to enhance their teaching methods and create effective curricula which includes assessment techniques that lead to better student learning results. The OBE framework functions as a key educational component which helps students develop necessary job skills for professional advancement and employment opportunities. The study compares both public and private universities to create useful findings which help higher education institutions in Bangladesh discover their best operational practices. The research study has the ability to create long-term enhancements which will elevate higher education standards while supporting educational progress and national development.

2.1 Literature Review

A Literature Review is a comprehensive synthesis of scholarly research on a specific topic, providing an overview of existing knowledge, theories, and findings while critically analysing and evaluating them. It serves to identify gaps in the literature, highlight trends, and contextualize the research problem. By summarizing and comparing previous studies, a literature review establishes a foundation for the research, demonstrating how the study builds on or diverges from existing work. Ridley, D. (2012).

2.2.1 Effective OBE curriculum

An effective Outcome-Based Education (OBE) curriculum refers to a structured and competency-based educational framework where learning is designed around clearly defined outcomes that students are expected to achieve by the end of a course or program. It emphasizes what learners can demonstrate in terms of knowledge, skills, and attitudes rather than only what is taught in the classroom. This concept was introduced and popularized by William G. Spady, who defined OBE as an education system focused on demonstrated learning outcomes (Spady, 1994).

An effective OBE curriculum is strongly grounded in the principle of constructive alignment, introduced by Biggs (1996), where learning outcomes, teaching activities, and assessment methods are systematically aligned to ensure meaningful learning. Biggs and Tang (2011) further explain that such alignment enhances the quality of learning by making education more structured, transparent, and outcome focused. In addition, Harden (2007) highlights that the effectiveness of an OBE curriculum depends not only on curriculum design but also on its proper implementation in teaching and assessment practices. Killen (2000) also emphasizes that clearly defined outcomes and structured assessment strategies significantly improve student learning achievement. Tam (2014) notes that outcome-based approaches improve educational quality when institutions effectively integrate learning outcomes into teaching delivery, assessment systems, and feedback mechanisms.

Gulikers et al. (2004) also argue that authentic assessment and real-world application are essential components of an effective OBE system, ensuring that students can apply their knowledge in practical contexts.

The OBE curriculum works as an academic framework which enables students to achieve required competencies through its combined teaching and assessment methods. The educational system's quality depends on the actual implementation of the system in classroom environments.

H1: Practical execution of OBE curriculum mediates the relationship between effective OBE curriculum and educational quality.

2.2.2 Skilled Faculties

Skilled faculties refer to university teachers who possess strong subject knowledge, pedagogical competence, and the ability to effectively deliver instruction in alignment with institutional learning outcomes. In higher education, faculty skill is considered a critical factor influencing teaching quality and student achievement. Skilled instructors are not only knowledgeable in their academic disciplines but also capable of applying modern teaching strategies, assessment techniques, and student-centered learning approaches. According to Shulman (1987), effective teaching requires both content knowledge and pedagogical content knowledge, which enables teachers to present subject matter in a way that enhances student understanding and learning outcomes.

In the context of Outcome-Based Education (OBE), skilled faculties play an even more important role because they are responsible for translating curriculum outcomes into practical classroom experiences. Biggs and Tang (2011) emphasize that effective teaching depends on constructive alignment, where instructors ensure that learning activities and assessments are aligned with intended outcomes. Similarly, Harden (2007) highlights that the success of OBE implementation largely depends on teachers' ability to apply outcome-based teaching strategies, continuous assessment, and feedback mechanisms in the classroom. Skilled faculties contribute significantly to educational quality by improving student engagement, critical thinking, and competency development. Tam (2014) argues that educational outcomes improve when teachers actively implement student-centered and outcome-focused teaching practices. In addition, Gulikers et al. (2004) emphasize that teachers' ability to design authentic learning and assessment tasks enhances students' real-world application of knowledge, which ultimately improves education quality. In this way, skilled faculties serve as a key independent variable in improving educational quality. However, their effectiveness is highly dependent on how well they implement the Outcome-Based Education curriculum in practice, ensuring that intended learning outcomes are achieved through proper execution.

H2: practical execution of OBE curriculum mediates the relationship between skilled faculties and educational quality.

2.2.3 Expertise Knowledge of Question Setter

Expertise of question setters refers to the academic and professional competence of faculty members in designing assessment tools that accurately measure students' achievement of intended learning outcomes. In an Outcome-Based Education (OBE) system, assessment is not merely a tool for grading but a critical mechanism for evaluating whether students have attained the defined competencies. Therefore, the ability of question setters to design valid, reliable, and outcome-aligned assessments is essential for ensuring educational quality. According to Nitko and Brookhart (2011), effective assessment requires strong content knowledge and an understanding of measurement principles to ensure that questions appropriately reflect learning objectives. In the context of OBE, expert question setters play a vital role in maintaining constructive alignment between learning outcomes, teaching activities, and assessment methods. Biggs and Tang (2011) emphasize that assessment tasks must directly measure intended learning outcomes to ensure meaningful evaluation of student performance. Similarly, Harden (2007) highlights that the success of outcome-based systems depends significantly on the quality of assessment design, where question setters must ensure alignment with competency-based frameworks. Gulikers et al. (2004) argue that authentic assessment enhances students' ability to apply knowledge in real-life contexts, which ultimately improves educational quality. Expert question setters contribute to this process by designing assessments that go beyond memorization and evaluate critical thinking, problem-solving, and applied skills. Tam (2014) also supports that educational quality improves when assessment systems are properly aligned with outcome-based learning objectives.

Thus, expertise in question setting serves as a crucial independent factor in enhancing educational quality. However, its effectiveness is largely dependent on how well it is implemented through the practical execution of the OBE curriculum in assessment design and evaluation processes.

H3: Practical execution of OBE curriculum mediates the relationship between expertise of question setters and educational quality.

2.2.4 Quality of Student

Quality of students refers to the overall academic preparedness, learning capability, motivation, and competency level of learners in higher education institutions. It reflects how effectively students can understand, apply, and demonstrate the knowledge and skills acquired through their academic programs. In an Outcome-Based Education (OBE) system, student quality is measured not only by academic performance but also by their ability to achieve predefined learning outcomes such as critical thinking, problem-solving, communication, and practical application of knowledge. According to Yorke (2006), student quality is closely linked to employability skills and the ability to transfer academic learning into real-world contexts. In the context of OBE, high-quality students are those who actively engage in learning processes and continuously work towards achieving specified outcomes. Biggs and Tang (2011) emphasize that student-centered learning approaches are essential in developing deeper understanding and higher-order thinking skills. Similarly, Harden (2007) highlights that OBE frameworks enhance student quality by focusing on measurable outcomes and competency development rather than rote memorization. Moreover, Tam (2014) argues that educational quality improves when students are actively involved in outcome-based learning environments that promote continuous feedback, self-directed learning, and performance-based assessment. Gulikers et al. (2004) also suggest that authentic learning experiences significantly enhance students' ability to apply knowledge in real-life situations, thereby improving their overall quality.

Thus, student quality serves as an important independent factor influencing educational quality in higher education. However, its effectiveness in improving educational outcomes largely depends on the practical execution of the OBE curriculum, which ensures that learning experiences are properly structured, delivered, and assessed according to intended outcomes.

H4: Practical execution of OBE curriculum mediates the relationship between quality of students and educational quality.

2.2.5 Training arrangements for teachers

Teacher training arrangements are a fundamental component in ensuring the successful implementation of Outcome-Based Education (OBE). According to Guskey (2002), teacher training is a key determinant of instructional improvement, as it directly influences classroom practices and student learning outcomes.

Effective teacher training is essential because it equips faculty members with the knowledge and skills required to implement outcome-based teaching, learning, and assessment strategies. Biggs and Tang (2011) emphasize that teachers must be trained to apply constructive alignment, ensuring that learning outcomes, teaching activities, and assessments are properly connected. Similarly, Harden (2007) highlights that successful implementation of OBE depends on continuous faculty development and training programs that support outcome-based instructional design and assessment practices. Desimone (2009) argues that effective professional development enhances teachers' ability to adopt innovative teaching methods, leading to improved student engagement and learning quality. Tam (2014) also supports that educational quality improves when teachers are properly trained to implement student-centered and competency-based education systems. Gulikers et al. (2004) additionally emphasize that teacher training improves the design of authentic learning and assessment tasks, which are essential for developing students' real-world competencies.

Thus, training arrangement for teachers plays a significant role in improving educational quality. However, its effectiveness largely depends on how well-trained teachers apply OBE principles in real classroom settings through proper execution of the curriculum.

H5: Practical execution of OBE curriculum mediates the relationship between teacher training arrangements and educational quality.

2.2.6 Institutional support

Institutional Support play a crucial role in outcome-based education system ensuring that curriculum design is effectively implemented in practice. According to Trowler and Bamber (2005), institutional support is a key driver of successful teaching innovation, as it enables academics to adopt new pedagogical approaches effectively.

In OBE-based education systems, strong institutional support ensures that learning outcomes are properly achieved through structured teaching and assessment processes. Biggs and Tang (2011) emphasize that constructive alignment requires not only competent faculty but also strong institutional backing in terms of resources and academic policies. Similarly, Harden (2007) highlights that the successful implementation of OBE depends on institutional commitment to faculty development, assessment systems, and continuous quality improvement. Tam (2014) argues that educational quality improves significantly when institutions provide adequate support for student-centered and outcome-based learning environments. Gulikers et al. (2004) also emphasize that institutional facilities and academic systems directly influence the effectiveness of authentic assessment and real-world learning experiences. Desimone (2009) additionally supports that institutional support enhances the implementation of professional development and teaching innovation, which ultimately improves student learning outcomes. So, institutional support serves as an important determinant of educational quality in higher education. However, its effectiveness is largely dependent on how well it is translated into practice through the proper execution of the OBE curriculum in teaching, learning, and assessment processes.

H6: Practical execution of OBE curriculum mediates the relationship between institutional support and educational quality.

2.2.7 Conceptual Framework

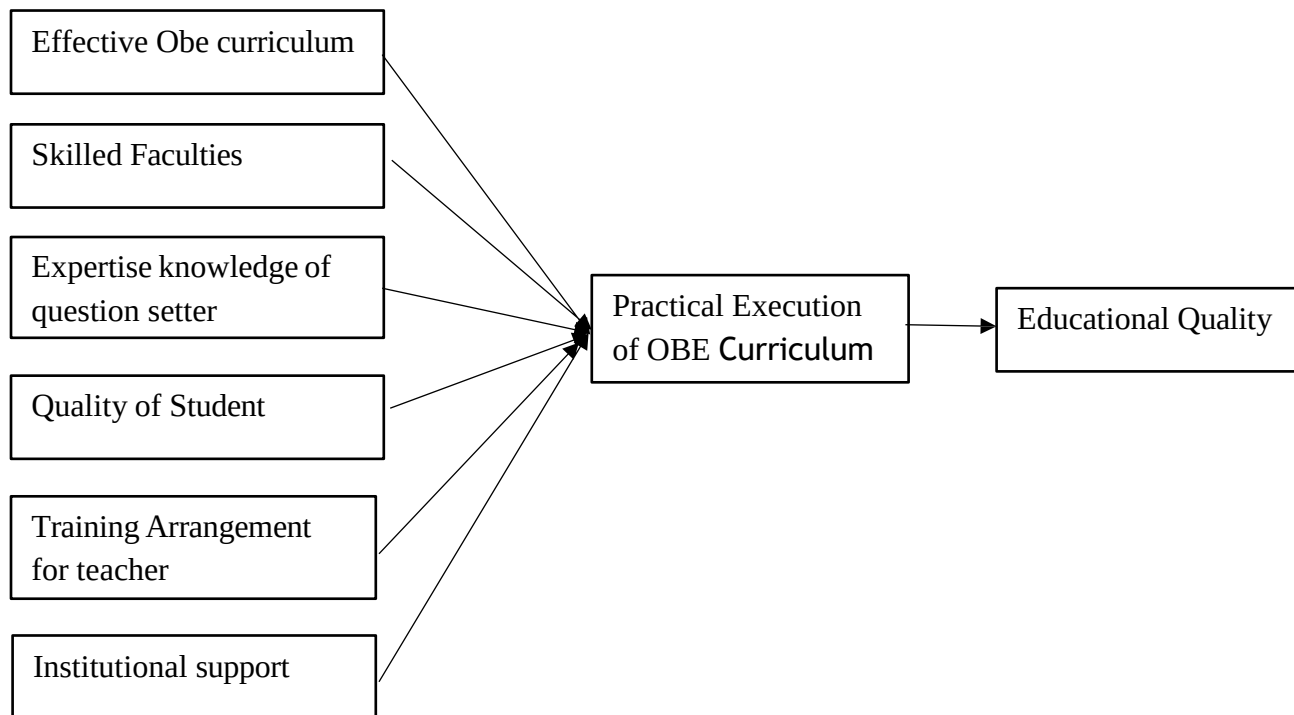


Figure 1: Conceptual Framework

3. Research Method

The study uses quantitative research methods to determine what factors affect Outcome-Based Education (OBE) implementation in Bangladesh and which determinants help enhance educational quality at tertiary institutions. The researchers used a cross-sectional survey design to obtain data from participants at one specific time. The data collection process used primary sources which researchers gathered through their structured questionnaire survey. The study's objectives and existing literature about OBE institutional support and curriculum design and practical execution and educational quality formed the basis for designing the questionnaire. The survey tool employed closed-ended questions which enabled consistent data collection and straightforward data analysis. A Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree) was used to measure the respondents' perceptions regarding different variables included in the study. The researchers used non-probability sampling methods which included purposive sampling to choose their study participants from both public and private universities in Bangladesh. Initially, the study aimed to collect responses from 210 participants from selected public and private universities in Bangladesh. However, a total of 209 valid responses were obtained and used for the final analysis, which enhances the reliability of the study findings. The constructs of the study, including institutional support, curriculum design, practical execution (mediating variable), and educational quality (dependent variable), were operationalized based on established measurement scales used in similar studies. All constructs were measured using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. This scale enables respondents to express the degree of agreement or disagreement with each statement, providing a standardized approach for capturing perceptions and attitudes related to the Outcome-Based Education (OBE) system.

Table 1: Measurement Items and Origin of the Factors

Constructs	Number of Items	Adapted From
Effective OBE Curriculum	4	William G. Spady (1994); Harden R.M. (2007)
Skilled Faculties	4	(Lee Shulman (1986); Darling-Hammond Linda (2000).
Expertise Knowledge of question setter	3	(Benjamin Bloom (1956); Anderson Lorin W. (2001))
Quality of student	5	Alexander Astin (1999)).
Training Arrangement for teachers	3	(Guskey Thomas R. (2002);
Institutional Support	4	(Burton Clark (1983) John W. Creswell (2014)).
Practical Execution of OBE Curriculum	3	(Biggs John & Tang (2011)).
Educational Quality	4	Harvey Lee (2004) Green Diana (1994)).

Sources: Adopted from Researchers

Descriptive analysis used to determine the demographic characteristics of the respondents. Cronbach's Alpha also used to test the validity of considerable constructs of the study. Structural Equation Model used to test the considerable hypothesis of the study.

4. Findings & their Analysis

4.1 Demographic Background of the Respondents

Table 2: Demographic Data

Variable	Category	Frequency	Percentages
Types of university	Private university	64	30.6%
	Public University	145	69.4%
Age	20-25	156	74.6%
	26-30	40	19.1%
	Above 31	13	6.2%
Current role	Academic administrator	3	1.4%
	Department head/Coordinator	3	1.4%
	Faculty Member	16	7.7%
	Others	27	12.9%
	Student	160	76.6%
Monthly Income	11000-20000	41	19.6%
	21000-30000	23	11.0%
	31000-40000	16	7.7%
	Above 41000	20	9.6%
	Less than 10000	109	52.2%

Source: SPSS output from primary data

The demographic profile of the respondents provides important insights into the composition of the sample and its relevance to the study. Firstly, in terms of the type of university, most respondents (69.4%) are from public universities, while 30.6% are from private universities. This indicates that the study is more heavily represent public university Students, which may reflect the overall higher enrollment in public institutions in Bangladesh. Secondly, the age distribution shows that most respondents (74.6%) fall within the 20–25 age group, followed by 19.1% in the 26–30 category and only 6.2% above 31 years. Thirdly, regarding the current role of the respondents, a significant majority (76.6%) are students, while faculty members account for 7.7%, and other categories such as academic administrators and department heads each represent only 1.4%. Finally, the monthly income distribution reveals that more than half of the respondents (52.2%) earn less than 10,000 BDT, while 19.6% fall within the 11,000–20,000 BDT range.

Table 3: Summarizes the measurement model outcomes

Constructs	Items	Factors Loading Value	Cronbach's Alpha	Average Variance Extracted (AVE)
Effective OBE Curriculum	EOC1	0.897	0.913	0.795
	EOC2	0.924		
	EOC3	0.851		
	EOC4	0.891		
Skilled Faculties	SF1	0.894	0.901	0.771
	SF2	0.803		
	SF3	0.906		
	SF4	0.906		
Expertise Knowledge of question setter	EKQS1	0.929	0.913	0.842
	EKQS2	0.902		
	EKQS3	0.922		
Quality of Student	QS1	0.886	0.939	0.805
	QS2	0.903		
	QS3	0.900		
	QS4	0.904		
	QS5	0.892		
Training arrangement for Teacher	TAT1	0.907	0.901	0.835
	TAT2	0.923		
	TAT3	0.910		
	IS1	0.901		
Institutional support	IS2	0.921	0.934	0.835
	IS3	0.920		
	IS4	0.913		
Practical Execution of OBE Curriculum	PEOC1	0.918	0.916	0.857
	PEOC2	0.933		
	PEOC3	0.925		
Educational Quality	EQ1	0.889	0.938	0.843
	EQ2	0.940		
	EQ3	0.923		
	EQ4	0.919		

Source: Smart Pls

The internal consistency reliability component in the current study implies that each measurement item has an appropriate and consistent factor loading in representing its respective construct. According to established reliability standards, factor loadings greater than 0.50 are considered acceptable, while values above 0.70 indicate strong reliability (Truong & McColl, 2011). In this study, the outer loadings of all indicators range from 0.803 to 0.940, which are well above the minimum threshold of 0.50 and also exceed the recommended level of 0.70. For instance, the items under Effective OBE Curriculum range from 0.851 to 0.924, Skilled Faculties from 0.803 to 0.906, and Educational Quality from 0.889 to 0.940. These results indicate that all items adequately measure their respective constructs and contribute significantly to the model, confirming the suitability of the measurement model in terms of reliability. AVE measures the amount of variance captured by a latent construct relative to the variance due to measurement error. It reflects how well the indicators explain the variance of their respective construct. According to Hair et al. (2017), AVE values should be equal to or greater than 0.50 to ensure convergent validity. In this study, all AVE values are above the recommended threshold, ranging from 0.771 to 0.857.

For example, Effective OBE Curriculum has an AVE of 0.795, Skilled Faculties 0.771, Expertise Knowledge of Question Setter 0.842, Quality of Student 0.805, Training Arrangement for Teacher 0.835, Institutional Support 0.835, Practical Execution of OBE Curriculum 0.857, and Educational Quality 0.843. These values confirm that each construct explains a substantial portion of variance in its indicators, thereby establishing convergent validity.

Construct reliability was further assessed using Cronbach's alpha values. The suggested value for Cronbach's alpha is 0.70 or above, which indicates acceptable to good reliability (Hair et al., 2019; Fornell & Larcker, 1981). In this study, all constructs demonstrate strong internal consistency, with Cronbach's alpha values ranging from 0.901 to 0.939. For instance, Quality of Student shows the highest reliability (0.939), while Effective OBE Curriculum and Expertise Knowledge of Question Setter both have 0.913, and Skilled Faculties and Training Arrangement for Teacher have 0.901. These results confirm that the measurement items are consistent and reliable in measuring their respective constructs. Convergent validity indicates how well the indicators of a latent variable correlate with each other, ensuring that they measure the same underlying concept. This is supported when outer loadings are greater than 0.70 and AVE values are above 0.50. In this study, both conditions are satisfied, as all indicator loadings exceed 0.70 and all AVE values are above 0.50. Therefore, it can be concluded that the measurement model demonstrates adequate internal consistency reliability and convergent validity, confirming that the constructs are reliable and appropriate for further structural model analysis.

Table 4: Discriminant Validity: Fornell- Larcker Criterion

	EKQS	EOC	EQ	IS	PEOC	QS	SF	TAT
EKQS	0.884							
EOC	0.878	0.854						
EQ	0.844	0.866	0.884					
IS	0.881	0.866	0.909	0.881				
PEOC	0.865	0.853	0.909	0.929	0.892			
QS	0.917	0.908	0.883	0.901	0.887	0.854		
SF	0.862	0.871	0.820	0.846	0.807	0.884	0.866	
TAT	0.816	0.814	0.846	0.893	0.871	0.861	0.785	0.880

Source: Smart Pls

To assess discriminant validity, the Fornell–Larcker criterion was applied, which is one of the most widely used methods in structural equation modeling. Discriminant validity ensures that each construct in the model is conceptually and empirically distinct from the others. According to Fornell and Larcker (1981), discriminant validity is established when the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with other constructs. This indicates that a construct shares more variance with its own indicators than with other variables in the model. As shown in the table, all diagonal values, which represent the square root of AVE, are higher than the corresponding off-diagonal values in their respective rows and columns. For example, constructs such as EKQS, EOC, EQ, IS, PEOC, QS, SF, and TAT all demonstrate this pattern, where the diagonal elements exceed the inter-construct correlations. This confirms that each construct is sufficiently distinct and captures a unique aspect of the research framework. The results indicate that there is no significant issue of overlap among the constructs, and each variable measure what it is intended to measure without interference from others. This strengthens the reliability and validity of the measurement model. Therefore, based on the Fornell–Larcker criterion, discriminant validity is successfully established in this study, supporting the adequacy of the constructs for further structural analysis.

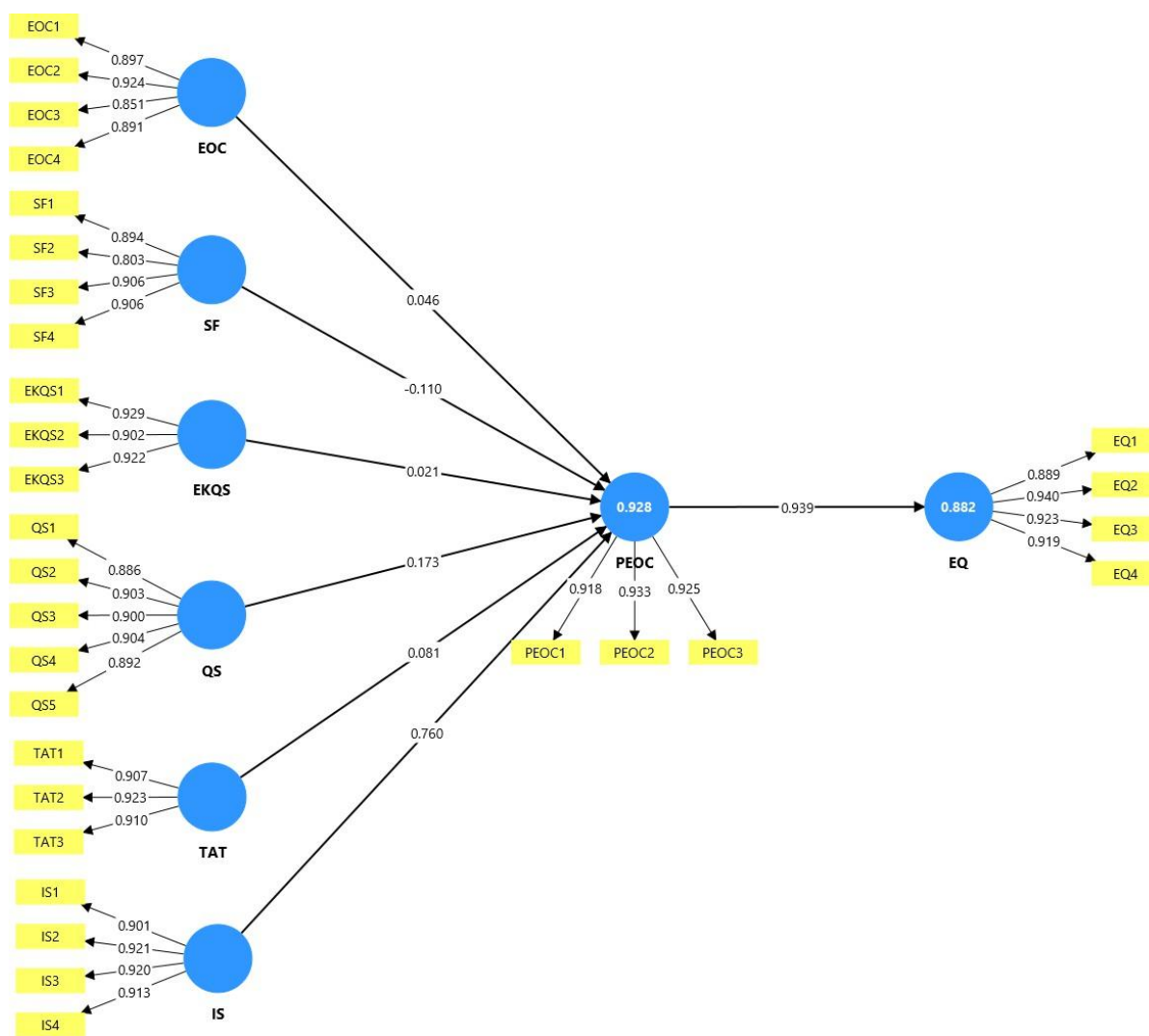
Table 5: Discriminant Validity- HTML ratio

	EKQS	EOC	EQ	IS	PEOC	QS	SF	TAT
EKQS								
EOC	1.006							
EQ	0.961	0.971						
IS	0.999	0.987	1.014					
PEOC	0.982	0.974	1.013	1.037				
QS	1.019	1.010	0.973	0.994	0.987			
SF	0.986	0.985	0.917	0.952	0.921	0.981		
TAT	0.955	0.957	0.966	1.000	0.989	0.976	0.927	

Source: Smart Pls

The Heterotrait–Monotrait (HTMT) ratio was also used to evaluate discriminant validity, providing a more robust and stringent assessment compared to traditional methods. HTMT measures the degree of similarity between constructs by comparing correlations across constructs with correlations within the same construct. According to Henseler et al. (2015), HTMT values below 0.85 indicate adequate discriminant validity, suggesting that constructs are sufficiently distinct from each other. In this study, however, the HTMT results show that several values exceed the recommended threshold. Some construct pairs demonstrate values close to or even above 1.00, indicating a high level of similarity between those constructs. This suggests that certain variables may not be fully distinct and could be measuring overlapping concepts. These findings highlight potential concerns regarding discriminant validity, as high HTMT values imply that respondents may not clearly differentiate between some constructs. This may be due to similarities in measurement items or conceptual definitions. Although the Fornell–Larcker criterion indicates acceptable discriminant validity, the HTMT results provide a more sensitive evaluation and suggest that improvements may be needed. Therefore, while the model demonstrates partial support for discriminant validity, caution should be taken in interpreting the results, and further refinement of the measurement model may enhance construct distinctiveness.

Figure 2: Measurement and Structural model by smart-PLS



Source: Smart Pls

4.3 Structural model Estimates

Table 6: Results of Hypothesis testing and Structural Relationships

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	t statistics (O/STDEV)	P values	Result
EKQS -> PEOC	0.021	0.016	0.081	0.261	0.794	Rejected
EOC -> PEOC	0.046	0.061	0.091	0.500	0.617	Rejected
IS -> PEOC	0.760	0.735	0.092	8.226	0.000	Accepted
PEOC -> EQ	0.939	0.939	0.013	71.410	0.000	Accepted
QS -> PEOC	0.173	0.188	0.089	1.944	0.052	Rejected
SF -> PEOC	-0.110	-0.104	0.054	2.040	0.041	Accepted
TAT -> PEOC	0.081	0.075	0.064	1.274	0.203	Rejected

Source: Smart Pls

Path coefficient values are standardized and typically range between -1 and $+1$ indicating both the strength and direction of relationships between variables. The results presented in Table (SmartPLS output) demonstrate that all estimated path coefficients fall within this acceptable range, confirming the model's validity in terms of structural relationships. The analysis examines the influence of several independent variables Expertise Knowledge of Question Setter (EKQS), Effective OBE Curriculum (EOC), Institutional Support (IS), Quality of Students (QS), Skilled Faculties (SF), and Training Arrangement for Teachers (TAT) on the mediating variable Practical Execution of OBE Curriculum (PEOC), as well as the effect of PEOC on Educational Quality (EQ). First, Institutional Support ($IS \rightarrow PEOC$) shows a strong positive and significant relationship, with a path coefficient of 0.760, a t-value of 8.226, and a p-value of 0.000. This indicates that institutional support plays a crucial role in enhancing the practical execution of the OBE curriculum. A one-unit increase in institutional support leads to a 0.760 unit increase in PEOC, holding other factors constant. This strong effect suggests that administrative backing, infrastructure, policy support, and resource availability are key drivers in successfully implementing OBE practices at the tertiary level. Second, the relationship between Practical Execution of OBE Curriculum ($PEOC \rightarrow EQ$) is extremely strong and highly significant, with a path coefficient of 0.939, a t-value of 71.410, and a p-value of 0.000. This is the most dominant relationship in the model. It clearly indicates that the practical implementation of OBE directly and substantially improves educational quality. In other words, when OBE is effectively executed in practice through proper assessment methods, outcome alignment, and teaching strategies it leads to a significant enhancement in the overall quality of education. Third, Skilled Faculties ($SF \rightarrow PEOC$) demonstrates a statistically significant but negative relationship, with a path coefficient of -0.110 , a t-value of 2.040, and a p-value of 0.041. Although the relationship is significant, the negative coefficient is somewhat unexpected. It implies that an increase in skilled faculties is associated with a slight decrease in the practical execution of OBE. This counterintuitive result may suggest potential issues such as resistance to change, lack of OBE-specific training, or misalignment between faculty skills and OBE requirements. It highlights the need for targeted training programs to ensure that faculty expertise aligns with OBE implementation strategies. The relationship between Quality of Students ($QS \rightarrow PEOC$) shows a path coefficient of 0.173, a t-value of 1.944, and a p-value of 0.052. This result is very close to the conventional threshold of significance ($p < 0.05$), making it marginally insignificant or weakly supported. This suggests that while student quality may have a positive influence on the execution of OBE, the effect is not strong enough to be considered statistically significant in this study. It indicates that even though capable students can contribute to better learning outcomes, the success of OBE implementation depends more heavily on institutional and structural factors rather than student-related characteristics alone.

The relationship between Expertise Knowledge of Question Setter (EKQS $\rightarrow$ PEOC) has a path coefficient of 0.021, a t-value of 0.261, and a p-value of 0.794, indicating no significant effect. This suggests that the expertise of question setters alone does not substantially influence the practical execution of OBE. One possible explanation is that OBE requires a holistic approach involving curriculum design, teaching methods, and assessment alignment, rather than relying solely on the expertise of individuals responsible for setting exam questions. Similarly, Effective OBE Curriculum (EOC $\rightarrow$ PEOC) shows a path coefficient of 0.046, a t-value of 0.500, and a p-value of 0.617, indicating an insignificant relationship. Although the curriculum is a fundamental component of OBE, this result implies that having a well-designed curriculum alone is not sufficient. Without proper implementation mechanisms, monitoring, and support systems, even an effective curriculum may fail to produce desired outcomes. Finally, Training Arrangement for Teachers (TAT $\rightarrow$ PEOC) has a path coefficient of 0.081, a t-value of 1.274, and a p-value of 0.203, indicating a non-significant effect. This finding suggests that existing training programs may not be adequately designed or effectively delivered to influence OBE execution. It highlights a potential gap in the quality, frequency, or relevance of teacher training initiatives related to OBE practices. The findings reveal that not all hypothesized relationships are supported. Among all determinants, Institutional Support emerges as the most influential predictor of practical OBE execution, followed by the direct and dominant impact of PEOC on Educational Quality. These results emphasize that structural and institutional factors play a more critical role than individual or curriculum-related factors in ensuring successful OBE implementation. The insignificant effects of EKQS, EOC, and TAT suggest that isolated improvements in these areas are insufficient without a comprehensive and coordinated approach. Meanwhile, the marginal role of student quality indicates that OBE success is less dependent on student input and more on how the system is designed and executed. The negative relationship of skilled faculties with PEOC raises important concerns and suggests the need for further investigation. It may reflect gaps in faculty readiness, resistance to new teaching methodologies, or lack of alignment with OB is the most dominant relationship in the model. It clearly indicates that the practical implementation of OBE directly and substantially improves educational quality. 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5. Practical Contributions

The findings of this study make several important contributions to the existing body of knowledge on Outcome-Based Education (OBE), particularly in the context of tertiary education in developing countries like Bangladesh. Prior research in the field of Outcome-Based Education has consistently emphasized that curriculum design, faculty competence, and assessment expertise are the key determinants of successful OBE implementation. However, the results of this study provide a more nuanced understanding by highlighting that not all traditionally accepted factors have a significant impact when examined empirically within a specific institutional context. The study identifies Institutional Support as the primary factor which establishes a direct link to successful OBE Curriculum implementation. The study results confirm the existing research which demonstrates that educational reforms require three essential components which include administrative dedication and operational resources and supportive policies.

The research established that educational systems fail to achieve their educational objectives because institutions need to provide backing to operate educational systems. The research demonstrates that institutional support operates as a critical factor which determines OBE execution efficiency. The study results show that governance factors together with organizational capacity development function as key elements which improve educational quality.

The study establishes a strong link between Practical Execution of OBE Curriculum and Educational Quality which serves as solid proof for underpinning OBE theoretical concepts. The current research shows that existing literature supports OBE because it emphasizes measurable learning outcomes and student-centered teaching and continuous assessment. The research demonstrates that students achieve better academic performance through OBE implementation which proves its effectiveness. The research establishes OBE practical application at universities through statistical evidence which confirms its earlier conceptual framework.

The study questions multiple established beliefs which researchers in the field had accepted. The study discovered that Effective OBE Curriculum shows no connection to Practical Execution of OBE Curriculum which conflicts with earlier studies that linked curriculum design to successful OBE implementation. The research demonstrates that OBE success requires educational institutions to implement multiple execution frameworks which extend beyond curriculum design. The research shows that developing countries face substantial implementation difficulties which create a gap between theoretical knowledge and practical application.

The study demonstrates that Question Setter assessment expertise does not act as a vital element which determines OBE execution success. The study found that assessment alignment with learning outcomes serves as a necessary element for educational success but individual expertise must connect to institutional frameworks for system-wide effects to occur. The study results indicate that organizations need to establish systems which link individual skills together with their respective departments.

The study discovered that Training Arrangement for Teachers produced no statistically significant outcomes. The study results conflict with multiple research findings which show that teacher training functions as an essential element for achieving OBE program success. The existing training programs face challenges with OBE requirements because they stay inactive or disconnected from OBE frameworks or they need complete operational redesign. The research shows that training holds significant value for development, but professional development programs need to transform into structured programs which deliver ongoing assessments of training outcomes. The relationship between Quality of Students and OBE Execution shows an interesting research area because of its presence.

The research discovered that OBE success remains more dependent on systemic elements than student-based factors because student ability and readiness play a minor role in educational achievement. The research shows that educational systems deliver high-quality results even when student performance levels decline.

The study discovered a negative link between Skilled Faculties and OBE Execution which creates an important research area. The study showed that skilled faculty members do not guarantee OBE success through their presence. The study cohort showed that students needed to maintain their traditional educational methods because they faced what seemed to be OBE requirements. The research shows that faculty competence acts as a vital factor in academic success but organizations need to study how faculty members engage with their roles.

The study provides evidence which both confirms and disproves the current research concerning OBE. The research establishes institutional support as essential for achieving OBE results but shows that individual elements like curriculum design and teacher training and personal expertise do not function as standalone solutions. The research results demonstrate that OBE implementation requires multiple system elements which develop into an integrated system for higher education in developing nations.

6.1 Recommendations

Based on the findings of this study, several practical and policy-oriented recommendations can be proposed to enhance the effectiveness of the Outcome-Based Education (OBE) system and improve educational quality at the tertiary level in Bangladesh. First, the study highlights the critical role of institutional support in ensuring effective implementation of OBE. Therefore, universities—both public and private—should prioritize strengthening administrative and infrastructural support systems. This includes ensuring adequate funding, modern classroom facilities, digital learning resources, and continuous monitoring mechanisms. Institutional leadership should also actively promote a culture that supports outcome-based practices, ensuring alignment between academic policies and OBE principles.

Second, since the practical execution of the OBE curriculum has the strongest impact on educational quality, universities should focus on bridging the gap between theoretical design and actual implementation. Departments should regularly review course learning outcomes (CLOs), program learning outcomes (PLOs), and assessment strategies to ensure proper alignment. Additionally, adopting modern teaching methodologies such as project-based learning, case studies, and real-world applications can significantly enhance the effectiveness of OBE implementation.

Third, the negative relationship between skilled faculties and practical OBE execution suggests a need for targeted faculty development programs. While faculty members may possess subject expertise, they may lack proper training in OBE methodologies. Therefore, institutions should arrange regular workshops, seminars, and training sessions focused specifically on OBE practices, assessment techniques, and curriculum alignment. These programs should be practical, continuous, and outcome-focused rather than theoretical.

Fourth, the insignificant impact of training arrangements indicates that existing training programs may not be effective. Universities should redesign these training initiatives by incorporating hands-on sessions, real-life case applications, and performance evaluation systems. Collaborations with international institutions or accreditation bodies can also help improve the quality and relevance of these training programs.

Fifth, the study finds that expertise in question setting does not significantly influence OBE execution. This suggests that assessment practices need a more comprehensive approach. Universities should develop standardized assessment guidelines that align with OBE principles, ensuring that exam questions measure higher-order thinking skills rather than rote memorization. Moderation and peer-review systems can also improve the quality and consistency of assessments.

Sixth, although the quality of students shows a marginal effect, institutions should still focus on enhancing student engagement and learning readiness. This can be achieved through orientation programs, academic counseling, mentoring systems, and skill development workshops. Encouraging active participation, critical thinking, and problem-solving abilities among students will support better OBE outcomes.

Finally, policymakers and regulatory bodies such as the University Grants Commission (UGC) of Bangladesh should play a proactive role in standardizing OBE implementation across universities. Developing clear guidelines, monitoring frameworks, and accreditation standards will ensure consistency and quality in OBE practices nationwide.

6.2 Future Research Direction

The study establishes crucial elements which determine Outcome-Based Education (OBE) because those elements guide OBE implementation. Multiple research possibilities exist which need to be explored by future studies to enhance the knowledge about OBE usage and its outcomes. The research focuses on public and private universities which the study selected in Bangladesh. A study could include more institutions from various regions to create a wider research scope which includes more institutions. The study will compare urban and rural universities to reveal important differences between these two contexts regarding OBE implementation and its results. The research will compare OBE practices from Bangladesh with those used in developing and developed countries through international studies. The research analyzes OBE through three essential components, which include curriculum design and teaching methods and assessment practices. The future research will examine how technological readiness and faculty training programs and institutional support and student engagement affect OBE implementation. The educational elements which OBE improves show better results through these elements. The study obtains data through a cross-sectional research design which permits researchers to collect information at one specific time. Researchers can use longitudinal studies to assess how OBE affects student performance and professional skills throughout their academic journey. The studies create stronger causal relationships which demonstrate how OBE results develop in educational outcomes.

The study identifies three mediating factors which need two moderating variables to extend their current scope. The study investigates how different groups respond to various situations which affect relationship strength. The study enables researchers to combine qualitative insights from faculty members with administrative staff and student data to create a complete understanding of their educational environment. The research team will conduct interviews and focus groups to gather practical information about OBE implementation which is not present in quantitative data. Researchers need to expand their research scope while studying additional factors through different research methods to create a comprehensive understanding of Outcome-Based Education which shows how it improves higher education quality in Bangladesh.

6.3 Conclusion

This study set out to examine the determinants of the Outcome-Based Education (OBE) system and their mediating role in improving the educational quality at the tertiary level in Bangladesh. Based on the empirical findings derived from the SmartPLS analysis, it can be concluded that the effectiveness of OBE largely depends not only on the presence of its core components but more importantly on how these components are practically implemented within the institutional framework.

The results clearly show that the Practical Execution of OBE Curriculum (PEOC) serves as an essential link that improves educational quality (EQ) through its mediating function. Proper implementation of OBE principles through outcome alignment and continuous assessment and skill-based evaluation leads to better educational standards according to the research which shows a strong link between PEOC and EQ. The research shows that organizations need complete OBE implementation which includes both planning and effective execution to reach their required standards.

The independent variable Institutional Support (IS) acted as the main deciding factor which impacted the actual OBE implementation process. The study demonstrates that successful implementation depends on organizational support together with institutional resources and existing policies and dedicated infrastructure. Well-designed OBE systems will not achieve their desired results when institutions lack adequate institutional support.

The variables Expertise Knowledge of Question Setter (EKQS) and Effective OBE Curriculum (EOC) and Training Arrangement for Teachers (TAT) showed no impact on PEOC. The results show that successful implementation requires more than having a structured curriculum together with knowledgeable personnel. The situation demonstrates an execution gap because institutions lack proper planning coordination while they already possess the necessary components for execution.

The Skilled Faculties (SF) variable showed a strong negative correlation with PEOC results which goes against common assumptions. Faculty members may resist adopting new teaching methods because they lack OBE training and their competencies do not match OBE requirements. The Quality of Students (QS) variable showed only a slight effect which indicates student skills do not determine OBE implementation success.

The study shows that to enhance educational quality the Bangladeshi tertiary institutions need a comprehensive method which requires both system implementation and institutional support and OBE element execution throughout their institutions. The university authorities together with policymakers should enhance execution systems through developing OBE-focused training programs and establishing ongoing monitoring and assessment processes. The institutional approach to these matters will enable full achievement of OBE system potential to deliver high-quality education and produce graduates with skills required by modern society.

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