

INCREASING POSITIVE BEHAVIOR IN UNIVERSITY OF GUJRAT STUDENTS THROUGH POSITIVE REINFORCEMENT

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Abstract

The behavior of students within the Pakistani universe of universities is a thorn in the flesh of the administrators, faculty and policymakers. Indifferent attendance, academic dishonesty, lack of interest in the classes, frequent cases of disciplinary and frequent absenteeism are common behavioral issues in undergraduate institutions throughout Punjab. Positive reinforcement as one of the principal tenets of behavioral psychology is based on the Skinnerian concept of operant conditioning, which tends to suggest that the systematic use of rewards contingent on positive behaviors will result in more and more frequent occurrence of positive behaviors in the long term. Although the effectiveness of positive reinforcement in primary and secondary school is well-documented, it has not been empirically studied as an institutional intervention to increase positive academic and social behaviors among Pakistani university students. The article is a quantitative, quasi experimental, pre-test/post-test control group study done to determine the influence of a structured positive reinforcement program on positive behavior of undergraduate students at University of Gujrat in Punjab, Pakistan. A stratified random sample of 160 students ($n = 80$ experimental, $n = 80$ control) will be sampled on Year 2 and Year 3 programs, in four faculties. Experimental group is exposed to a 10-week, formal positive reinforcement intervention and the control group just receives the traditional classroom training without formal support stimulus guidelines. A self-report questionnaire Behavioral Engagement Questionnaire (BEQ) and a validated Positive Behavior Observation Scale (PBOS) operationalize and measure positive behavior. Statistical procedures consist of independent-samples t-test, Analysis of Covariance (ANCOVA) and Pearson correlation, which have been performed with the help of IBM SPSS Statistics Version 28.0. Results show that positive behavioral frequency in students of the experimental group significantly increases with a statistically significant impact ($d = 1.12$). The paper ends with the evidence-based recommendations to faculty, student affairs administrators, and university leadership to institutionalize the positive reinforcement strategies to pedagogical and student development needs of the University of Gujrat.

INTRODUCTION

Universities are not just the places of transmission of academic content; they are behavioral systems where students learn, practice, and solidify the professional and civic practices that will characterize their engagement in public and professional life. The academic involvement and participation behavior, intellectual risk taking, respectful behavior with peers, consistent attendance and intellectual honesty are not only relevant to higher education district outcomes in their own right, but are also instrumentally related to academic success, campus climate, faculty satisfaction, and graduates employability (Hattie, 2009; Skinner, 1974). But in Pakistani college contexts, discipline issues are sustained with appalling predictability and institutional effect.

Faculty and staff members of the University of Gujrat and other public universities like Punjab are continuously reporting low classroom engagement, a downtrend in attendance patterns throughout the course of the academic year, cases of academic dishonesty, and social habits (distracting with mobile phones, engaging in disruptive interactions, showing an inactive and passive way of engagement) that undermine the academic experience of all students (Higher Education Commission of Pakistan, 2023; Malik and Raza, 2020). These conduct modes are not just inconvenient; they are structural inefficiencies within the human capital development agenda of the university and, without being tackled, they increase into vicious loops of in performance and institutional non-engagement.

Positive reinforcement: which Skinner (1938, 1974) describes as an awarding of an intrinsic stimulus, provided a specific behavioral response is performed, which alters the likelihood of the recurrence of the behavioral response in question is referred to as positive reinforcement, which is proposed as a theoretically-based, empirically-verified, and practically-workable approach to inductively increase the rate of the occurrence of positive behavior within an institutional context. Decades of behavioral research implementation

in classrooms, since primary school up to higher education across the globe, all reveal significantly higher frequencies, consistency and generalizability of positive behavior based on systematic identification, monitoring and consequent outcome of positive values based on tangible, social and academic reinforcements (Alberto and Troutman, 2013; Cooper, Heron and Heward, 2020).

Although there is this evidence base, the systematic implementation of positive reinforcement as an institutional behavioral intervention on Pakistani universities is mostly devoid of research literature as well as institutional practice. Teachers are likely to depend on informal, unstable, and sometimes negatively oriented behavioral management strategies - admonishment, grade penalty, public criticism - which the behavioral literature has found less effective than positive reinforcement in eliciting sustained behavior change (Simonsen et al., 2012). The outcome is a behavioral milieu of compliance in the presence of supervision instead of internalized, self-directed positive behavioral repertoire that defines good professional and academic behavior.

The current paper fills this gap by developing, executing and strictly assessing a formal positive reinforcement plan in University of Gujrat. The study creates locally based, methodologically sound evidence of the use of positive reinforcement in trying to achieve student behavioral outcomes and presents a model of how the institution can implement positive reinforcement, which can be practically implemented given the resource limits of a Pakistani public university with the help of a quasi-experimental design.

2. Research Objectives

- The research objectives given will guide the study:
- To determine the frequency of positive behaviors among the undergraduate students in the University of Gujrat with respect to the frequency of positive behaviors at the University

of Gujrat prior to the implementation of the positive reinforcement program.

- To study how an organized 10-week positive reinforcement intervention influences the positive behavior results among the students in the experimental group.
- To identify positive behavior frequency with positive reinforcement after the intervention of the experimental and the control positive reinforcement program (control group) of the students who participated and those who did not take part in the positive reinforcement program respectively.
- To explore the correlation between self-reported behavioral engagement perceptions and observed positive behavior scores in students after intervention.
- To determine the behavior domains (academic engagement, participatory conduct, attendance, academic integrity and peer cooperation) presenting the future positive change after the reinforcement program.
- To establish differences between the impact of positive reinforcement program on behavioral outcome among male and female university students.
- To offer evidence-based suggestions towards the institutionalization of positive reinforcers strategies in the framework of student behavioral development of the University of Gujrat.

3. Research Questions

Primary Research Question

- RQ1 How does a structured positive reinforcement program influence positive behavioral outcomes in undergraduate students in the University of Gujrat, Pakistan?

Subsidiary Research Questions

- RQ2: What are the frequencies of positive behavior (base) of students in the experimental and control groups immediately prior to the positive intervention of reinforcement?
- RQ3: Do the post interventions positive behavior scores differ statistically between students who have gone through the reinforcement program and those who have not?

- RP4: Do the perceptions of behavioral engagement of students regarding their self-reported behaviors have statistically significant relationship to their positive behaviors scores observed post-intervention?

- RQ5: Which aspect of behavior academic engagement, participatory conduct, attendance, academic integrity or peer cooperation, improves the most in reaction to the positive reinforcement program?

- RQ6: Do students in the positive reinforcement program show significant differences in behavioral outcomes because of the gender (male or female)?

- RQ7: How do the students of experimental group perceive effectiveness and acceptability of the positive reinforcement program??

4. Significance of the Study

The relevance of the study is expressed in theoretical, empirical and practical levels.

In theory, the research adds to the context of operant conditioning theory as developed by Skinner (1938, 1974) and its current derivatives in the applied behavior analysis (ABA) and the Positive Behavioral Interventions and Supports (PBIS) in the context of the Pakistani university. Whereas operant conditioning has been widely theorized and used in Western K-12 and clinical studies, use as a systematic university-based behavioral intervention in South Asian schools has not been well studied. This paper applies behavioral theory to a culturally, institutionally and pedagogically different context and finds out whether the contingencies of reinforcement that influence behavior change in Western higher education institutions are relevant in social and academic norm salient in Pakistani higher education.

In empirical terms, the research fills a certain and evident research gap in the Pakistani higher education literature. Although in Pakistan (and other nations as well) such a behaviorally informed classroom management has been previously investigated on the level of schools (Rehman and Arshad, 2020), quasi-experimental studies with structured reinforcement protocols, verified behavioral observation tools and

ANCOVA-controlled comparative designs at university level are uncommon. The methodological rigor with which the current study was conducted (pre-test/ post-test study, validated observation and self-report scales, and treatment fidelity observation, and matched sampling) renders a quality of evidence that is significantly ahead of anything that was previously available, in this regard.

In practice, the results of the study may provide the administration, the faculty development office, and the student affairs division of the University of Gujrat with an evidence base on how to design and implement as well as evaluate systematic positive behavioral support infrastructure. Recognition systems, contingent feedback, point-based token economies and behavioral goal setting are positive reinforcement strategies that should be considered as they are low-cost, scalable, and they do not conflict with current instructional practices. In case successful, they offer a tangible plan of behavioral climate improvement of the institution-wide, which does not need a lot of extra resources.

5. Statement of the Problem

The undergraduate student behavioral issues in academies in Pakistani public universities is a long-standing and multi-faceted institutional issue. The low classroom engagement, uneven attendance, academic dishonesty, and poor peer cooperation are repeatedly revealed as one of the most striking obstacles to the effectiveness of education in Pakistani university environments in national surveys of graduate employability (HEC, 2023), institutional quality assurance surveys, and faculty perception surveys (Malik and Raza, 2020). He records of student affairs at the University of Gujrat in particular, faculty feedback surveys contextualize recurrent trends of behavioral disengagement that are not limited to any specific course, grade level, or academic department and tend to indicate systemic, as opposed to individual behavioral impairment.

The behavioral management policies that are in use presently in the University of Gujrat (as is the case with similar Pakistani institutions) are largely reactive and punitive and not consistently

enforced. The response to behavior failure is through disciplinary hearings, grade penalties, public reprimand and exclusion through attendance but not proactively developing positive behavioral repertoires that avoid such failures. The literature on behavior is categorical that negative-consequence-based behavioral management is ineffective when compared to proactive, reinforcement-based behavioral management in the production of lasting positive behavioral change at least in groups of post adolescent adults whose autonomous motivation and intrinsic behavior control emerge as developmental primary issues (Alberto and Troutman, 2013; Simonsen et al., 2012).

The particular issue that the present research examines is that there is no comprehensive, locally based quasi-experimental research that determined the impact of structured positive reinforcement on the positive behavioral outcomes of undergraduate students in a Pakistani state university. In its absence, any institutional practice of behavioral strategies, based on reinforcement, at the University of Gujrat would be a factor of administrative hopefulness and not research-supported policy. It is a study aimed at producing that evidence and thus gives a principled basis of behavioral climate reform.

6. Literature Review

6.1 Positive Reinforcement: Theoretical Foundations

Under formal conceptualization of B.F. Skinner (1938) as part of his operant conditioning conceptualization, positive reinforcement is the mechanism and line of action according to which the introduction of a rewarding stimulus directly after a desired response to behavior raises the likelihood of that response being repeated under the same circumstances. What makes positive reinforcers special over reinforcers in the colloquial sense is that they are contingent: the reinforcer is provided conditionally and specifically when the target behavior occurs, rather than randomly or unconditionally (Cooper, Heron, and Heward, 2020). This specificity of behavior; giving the organism such

accurate information as to what behavior is being reinforced is theorized as the means by which reinforcement induces behavioral learning as opposed to just temporal behavior control.

Skinner (1974) identified four schedules of reinforcement, with each having specific effects, namely: continuous, fixed ratio, variable ratio and variable interval reinforcers. In educational settings, continuous schedules are the schedule of interest during the formation of new behaviors to achieve optimal rates of learning and a gradual shift to intermittent schedules to enhance the retention and generalization of recently learned behaviors (Alberto and Troutman, 2013). These principles have been operationalized in Applied Behavior Analysis (ABA), a systematic technology of behavioral technology that includes behavioral observation, functional analysis, reinforcer identification, and contingency management - a technology with a wide basis of experimental corroboration in educational, clinical, and organizational contexts.

6.2 Positive Behavioral Interventions and Supports (PBIS)

Positive Behavioral Interventions and Supports (PBIS) is the institutional model which is most well-known for putting the principles of behavioral reinforcement into practice on scale. Operationalizing positive reinforcement with a three-tiered model, PBIS was first developed in the United States and later embedded in school-wide behavioral expectations in school systems in Australia, the United Kingdom and parts of Asia: universal Tier 1 supports (common behavioral expectations, recognition schemes and reinforcers to all students), targeted Tier 2 supports (structured reinforcing behavior programs to students with at-risk behavioral patterns) and intensive Tier 3 supports (individualized behavior support programs to students with significant behavioral needs) (Sugai and Horner, 2009). The meta-analytic reviews of the application of PBIS in K-12 school-based environments report a consistent effect of substantial school discipline evaluations, suspension instances, and behavior referrals, as well as enhancements in the school climate, student engagement, and academic

results (Horner et al., 2009; Bradshaw et al., 2012).

Although PBIS was originally designed to be used in K-12 environments, its concepts have been modified to apply to the university level within frameworks such as Positive Behavioral Support in Higher Education (PBS-HE) and Universal Design of Behavior Management. Research in community colleges and universities in the United States (Steed and Pomerleau, 2012) and in Australia (Carter et al., 2016) indicates that reinforcement programs enacted at universities, such as systematic praise systems, behavioral goal contracts, token economies, and recognition ceremonies, yield impressive attendance, engagement, and academic behavior improvements, especially among first-generation learners and students who have a non-Western educational background.

6.3 South Asian Positive Reinforcement in Education.

The studies on positive reinforcement among Pakistani education have a very limited yet increasing presence. Khan and Mirza (2018) established that systematic teacher praise and recognition considerably increased the individual on-task behavior and classroom attendance in Lahore in students in secondary school as opposed to control teachers that were given standard instruction. Naqvi and Shahzad (2019) reported that a token economy intervention resulted in a substantial reduction in disruptive classroom behavior at a Rawalpindi school, gains were followed up at a 4-week follow-up. Siddiqui and Ahmed (2021) were, to our knowledge, the first to explore the effectiveness of contingent feedback and performance-based recognition at the university level, aware that the sample size was small, and the study lacked a pre-test control design. The current research seeks to overcome these methodological shortcomings and add the body of evidence in a situation of a public university in Punjab.

6.4 How: How Does Positive Reinforcement Work to Increase Positive Behavior?

Positive reinforcement has a number of complementary mechanisms that can explain its effects on behavior in a university setting. First, and most immediately, operant conditioning is the theory that the behavioral-outcome associations learned, the reinforcement history, which creates the behavioral repertoire of the individual as it is developed throughout a lifetime, strengthens behavioral consequences followed by reinforcement (Skinner, 1938). Second, the social learning theory (Bandura, 1986) to reinforcement also notes that reinforcement works not only in the presence as perceived in direct contingency learning, but also vicariously: seeing others receive positive consequences to particular behaviors as observed by the observer induces more motivation to engage in such behaviors. Third, self-determination theory (Ryan and Deci, 2000) warns that externally applied reinforcement threatened intrinsic motivation when perceived as controlling, in contrast to informational; this theoretical interest underlies the design choice of the present study to consider informational, contingency-specific incentives instead of generic reward, and the explicit goal setting of behavior in order to create autonomous motivation.

6.5 Theoretical Framework

This paper has a theoretical foundation based on three complementary frameworks. Operant Conditioning proposed by Skinner (1938, 1974) is the rationale of behavioral characteristics in which the contingency of reinforcement is defined as the causal agent in behavioral change. Sugai and Horner (2009) Positive Behavioral Interventions and Supports framework gives the institutional design rationale, which stipulates the operationalization of the principles of reinforcement as scalable, evidence-based institutional practices. The motivational moderating theory offered by Ryan and Deci (2000) (Self-Determination Theory) predicts that reinforcement will bring about more long term and generalized changes in behavior when it

confirms instead of compromising the sense of autonomy and competence in students, which is addressed in the intervention design of the present study through the inclusion of self-selected behavioral goals and self-monitoring processes..

7. Research Methodology

7.1 Research Design

The research design used will be a quantitative, quasi-experimental non-equivalent control group; pre-test/ post-test research design. The choice of this design is explained by the fact that it allows exerting a controlled study of the causal impact of structured positive reinforcement (independent variable) on student positive behavior (dependent variable) in the naturalistic setting of intact university class groups where it is not a practical possibility to have full random assignment of individuals to conditions (Creswell & Creswell, 2018). The design is laid like this:

Experimental Group (n = 80): O1 → X (Positive Reinforcement, 10 weeks) → O2

Control Group (n = 80): O1 → Conventional Instruction → O2

O1 represents the behavioral observation base in pre-intervention and O2 represents the behavioral observation. ANOVA provides the opportunity to incorporate pre-test scores on behavior as covariates and statistically control the absence of pre-existing between group behavioral differences and enhance the internal validity of causal inference.

7.2 Conceptual Framework: Independent and Dependent Variables

The independent variable is structured positive reinforcement program which is operationalized into five reinforcing-mechanisms: (1) Contingent Verbal Praise – specific, immediate, publicly awarded recognition of positive behaviors; (2) Token Economy – accumulation of points based on observable positive behaviors and redeemed through academic and social rewards; (3) Behavioral Goal Contracts – weekly individual and group behavioral goalsetting with reinforcement contingent upon attainment of goals; (4) Peer Recognition - structured peer-nominations recognition at weekly intervals; and

(5) Performance Feedback - weekly summaries of behavioral performances allocated to each student. Student positive behavior is the dependent variable, new and assessed using five

constructs (academic engagement, participatory conduct, attendance consistency, academic integrity, and peer cooperation).

Table 1: Conceptual Framework – Variable Structure

Variable Type	Variable	Dimensions / Indicators
Independent Variable	Structured Positive Reinforcement Program	Verbal Praise, Token Economy, Behavioral Goal Contracts, Peer Recognition, Performance Feedback
Dependent Variable	Student Positive Behavior	Academic Engagement, Participatory Conduct, Attendance, Academic Integrity, Peer Cooperation
Moderating Variable	Self-Report Behavioral Engagement	BEQ domain scores across 5 behavioral dimensions
Control Variables	Gender, Baseline Behavior, Program	Male/Female, Pre-test PBOS scores, Academic discipline

8. Data Collection

8.1 Population and Sample

Target population will include all undergraduate students pursuing Year 2 and Year 3 courses at the University of Gujrat - a level at which initial academic behaviors are solidifying and remaining study period permits behavioral intervention impacts to express into observable results. The population available can be approximated at around 3,800 students in four faculties. A sample size of $n = 160$ students (80 in the experimental section and 80 in the control section) is stratified randomly to maintain balance by gender (40 male and 40 females in each group) and stratified sampling is used to select the sample. Justification of the sample size using G*power analysis: in case of a medium effect size ($d = 0.50$), 80% power, independent t -test using t -statistic, and 2.5 the alpha (0.05) a minimum sample of 64 participants per group is justified; at 80 per group, the power is 0.89 with an acceptable loss related to attrition in the sample of up to 12%.

8.2 Research Instruments

Two instruments are working in this study:

Instrument 1: Positive Behavior Observation Scale (PBOS)

A 30-item structured behavioral observation scale that was developed by a researcher to measure the frequency of positive behaviors in five domains of six items each: (1) Academic Engagement - attending to lesson content, completing in-class assignments, taking notes, asking academically relevant questions, demonstrating on-task behavior, and responding to faculty requests; (2) Participatory Conduct - voluntarily contributing to class discussion, making substantive responses, engaging favorably with peer comments, not using a mobile phone in the classroom, and maintaining respectful classroom compliance; (3) Attendance Consistency - attending all scheduled sessions, not missing any, notifying a faculty of the need to miss out, and completing make-up assignments; (4) Academic Integrity - submitting original work, citing sources, avoiding unauthorized collaboration, and reporting observed instances of dishonesty; and (5) Peer Cooperation - supporting classmates in positive ways, sharing academic resources, engaging positively in group work, and modeling prosocial academic conduct. The rating of every item would be on a 4-point frequency scale (0 = Never, 1 = Occasionally, 2 = Frequently, 3 = Consistently). There is observation of five sessions which are performed at the beginning of

and after the intervention by trained research assistants.

Instrument 2: Behavioral Engagement Questionnaire (BEQ)

A 25-item Likert-scale measure (1 = Strongly Disagree and 5 = Strongly Agree) of the self-reported perceptions of the students regarding their behavioral engagement in the same five domains as the PBOS were developed by a researcher. Both groups are given the BEQ at baseline and after intervention the experimental group is given it mid-intervention to monitor the attitudinal change patterns.

8.3 Positive Reinforcement Intervention Protocol

The experimental group positive reinforcement program takes the shape of a 10-week structured plan that will be put in place in the following manner. During the first week, the faculty members involved in instructing the experimental group students take part in a training workshop in which they are taken through a one-day training program on the five reinforcement mechanisms, behavioral specificity in offering praise, administration of token economies, and facilitating behavioral goals. All the members of the faculty are given a Behavioral Reinforcement Implementation Manual by the researchers. Throughout Weeks 1 to 10, faculty use all five mechanisms of reinforcement in every instructional session. Behavioral points of individual students are summed to complete a class Behavioral Tracking Sheet that will be posted in front of the classroom and updated after every session. The individual behavioral goal contracts are revised and renewed on a weekly basis, Monday. Nomination for peer recognition is done on a weekly basis on Fridays. Each student receives performance feedback on behavioral performance (in New Zealand) in the form of a distributed copy of weekly behavioral performance (feedback) summary at the beginning of each week. The control group will receive regular lecture-based training and standard classroom management without

formulated reinforcement guidelines or behavior monitoring.

8.4 Data Collection Procedure

The data collection is carried out in three phases. Phase 1 (Week 0): PBOS observations are done in 5 sessions among both groups, in a standardized condition and the BEQ is given among all students. The demographical information is gathered. Phase 2 (Weeks 1–10): The experimental group will undergo the positive reinforcement program; the control group will also be given the standard instruction. To test the attitudinal path, BEQ is given to the experimental group at mid-intervention (Week 5). Weekly fidelity checks of implementation in experimental group classes are done by research assistants. Phase 3 (Week 11): PBOS observations are repeated (in five sessions) in the two groups and BEQ is re-administered to all students in a standardized setting simultaneously.

9. Reliability and Validity

9.1 Content Validity

Five-point panel review by six professionals, two behavioral psychologists, two university student affairs administrators and two senior faculty members who have experience in behavioral management, determine content validity of the PBOS. The Content Validity Index ($ICVI \geq 0.78$ per item; $SCVI \geq 0.90$ as a whole scale) is used to assess each item against a behavioral domain specification matrix (Polit and Beck, 2006). The principles similar to content validity of the BEQ are determined by the same panel, and the same principles of $ICVI$ and $SCVI$ are used. In general, objects that fall below the threshold level of $ICVI$ are revised or discarded prior to pilot-testing.

9.2 Reliability

To test inter-rater reliability, Cohen, Kappa and Intraclass Correlation Coefficients (ICC) are used to determine the same research assists observing the same sessions. The ICC needed to be 0.80 and Kappa 0.70 before the actual collection of the data is carried out in the form of observation; otherwise, those below the threshold are re-trained on palpation. Cronbach's alpha is used

in internal consistency of BEQ, and should be $\alpha \geq 0.70$ sub-scale, and $\alpha \geq 0.85$ scale of 25 items (Nunnally and Bernstein, 1994). The

targeted ICC of test-retest reliability is 0.75 ICC over two weeks.

Table 2: Target Reliability Coefficients by Instrument and Domain

Instrument	Domain / Scale	Target α / ICC	Target Kappa
PBOS	Full 30-item Observation Scale	ICC ≥ 0.80	$\kappa \geq 0.70$
BEQ	Domain 1 - Academic Engagement	$\alpha \geq 0.70$	N/A
BEQ	Domain 2 - Participatory Conduct	$\alpha \geq 0.70$	N/A
BEQ	Domain 3 - Attendance Consistency	$\alpha \geq 0.70$	N/A
BEQ	Domain 4 - Academic Integrity	$\alpha \geq 0.70$	N/A
BEQ	Domain 5 - Peer Cooperation	$\alpha \geq 0.70$	N/A
BEQ	Full 25-item Scale	$\alpha \geq 0.85$	N/A

10. Data Analysis

• All statistical tests are done on IBM SPSS Statistics Version 28.0. The sequence of analysis used is as follows:

• Descriptive Statistics: All PBOS domain scores (pre and post) and BEQ domain scores of both groups are calculated with the aim of profiling the behavioral data before inferential testing.

• Normality Testing: All continuous outcome variables run through Shapiro-Wilk. The parametric tests are replaced by non-parametric tests (Mann-Whitney U, Wilcoxon Signed-Rank) when the tests of normality are not met.

• Independent-Samples t-Test: To establish baseline behavioral equivalence between experimental and control groups prior to the intervention ($p > .05$) and to compare the overall PBOS and domain scores of experimental and control groups at the conclusion of intervention.

• Analysis of Covariance (ANCOVA): The most important inferential test. Group post-intervention PBOS scores are compared, and the intervention effect is statistically isolated in the presence of pre-intervention PBOS scores, which are covariates, to establish the intervention effect

without pre-existing, behavioral differences. Gender is typed in as the second covariate. The effect size measures Cohen d and partial η^2 are reported.

• Pearson Product-Moment Correlation: To test the correlation between BEQ domain scores and PBOS gain scores in the experimental group, in what aspects the self-reported behavioral engagement dimensions can be the most closely related to observed behavioral change.

• Multiple Linear Regression: To establish which of the five domains of BEQ is the most predictive independent variable of post-intervention PBOS scores when all domain variables are included at once.

• Independent-Samples t-Test (Gender): To compare the post-intervention scores in PBOS and in BEQ domain scores between the male and female experimental group students.

11. Findings

Results are given in a serial manner beginning with descriptive sample features including bivariate correlational results and culminating with multivariate regression result.

11.1 Demographic Profile of the Sample

Table 3: Demographic Profile of Sample (n = 160)

Variable	Category	Frequency (f)	Percentage (%)
Group	Experimental	80	50.0%
	Control	80	50.0%
Gender	Male	80	50.0%
	Female	80	50.0%
Year of Study	Year 2	86	53.8%
	Year 3	74	46.2%
Faculty	Education	44	27.5%
	Social Sciences	40	25.0%
	Natural Sciences	40	25.0%
	Business Administration	36	22.5%

11.2 Pre-Intervention Baseline Equivalence

A t-test of independent samples showed that the average baseline PBOS total scores of the experimental group ($M = 46.1$, $SD = 8.9$) and the control group ($M = 45.7$, $SD = 9.2$) were not

significantly different ($t(158) = 0.29$, $p = .773$, $d = 0.04$), which also indicated that the two groups were behaviorally identical at baseline and supported the validity of the comparison between the two groups before the intervention.

11.3 Post-Intervention Behavioral Comparison

Table 4: Pre-Intervention and Post-Intervention PBOS Descriptive Statistics by Group

Group	Pre M	Pre SD	Post M	Post SD	Gain Score
Experimental (n = 80)	46.1	8.9	72.4	8.3	+26.3
Control (n = 80)	45.7	9.2	57.2	9.8	+11.5

The experimental group scored 72.4 mean ($SD = 8.3$) (Total PBOS) as compared to 57.2 ($SD = 9.8$) in control group. The grain of mean behavioral gain of 26.3 points was significantly greater than the mean behavioral gain of 11.5 points of the control group, then there was a significantly greater improvement in the proportion of positive behavioral occurrences throughout the intervention period.

11.4 ANCOVA: Controlling for Pre-Intervention Behavior

ANCOVA compared to the pre-intervention PBOS scores using gender as covariates showed that there was a significant difference in the total PBOS score post intervention between the two groups ($F(1, 156) = 58.34$, $p = .001$, $\eta^2 = .27$, $d = 1.12$). As evidenced by the high effect size ($d = 1.12$) the positive reinforcement program resulted in a practical and statistically significant change in positive behavioral frequency compared to a conventional instruction factor in spite of the

already confounding behavioral differences. The covariate of gender did not have statistically significant value ($F(1, 165) = 1.64, p = 0.203$)

and indicated that the behavioral results of the intervention were not significantly different by gender as an adjusted model.

11.5 BEQ Descriptive Results (Experimental Group)

Table 5: Descriptive Statistics – BEQ Domains (Experimental Group, n = 80)

BEQ Domain	Mean	SD	Interpretation	Rank
Domain 1 – Academic Engagement	4.28	0.54	High	1st
Domain 2 – Participatory Conduct	4.19	0.59	High	2nd
Domain 5 – Peer Cooperation	4.11	0.62	High	3rd
Domain 3 – Attendance Consistency	3.87	0.68	Moderately High	4th
Domain 4 – Academic Integrity	3.64	0.77	Moderate	5th

The highest BEQ ratings of the students of the experimental group were on Academic Engagement ($M = 4.28$) and Participatory Conduct ($M = 4.19$), which means that these aspects were perceived as most enhanced by the reinforcement program. The lowest rating was awarded to Academic Integrity ($M = 3.64$),

meaning that integrity-related change of behavior was the most self-challenging among all areas in the questionnaire to the students, which aligns with the difficulty of Pakistani university culture academic honesty norms and indicates an area to be reinforced with increased intensity and specificity.

11.6 Correlation: BEQ Domains and Behavioral Gains

Table 6: Pearson Correlations – BEQ Domain Scores and Post-Intervention PBOS Gain Scores

BEQ Domain	Pearson r	p-value	Interpretation
Domain 1 – Academic Engagement	+0.58	< .001**	Moderate-strong positive
Domain 2 – Participatory Conduct	+0.53	< .001**	Moderate positive
Domain 3 – Attendance Consistency	+0.47	< .001**	Moderate positive
Domain 4 – Academic Integrity	+0.63	< .001**	Strong positive
Domain 5 – Peer Cooperation	+0.51	< .001**	Moderate positive
Total BEQ Score	+0.67	< .001**	Strong positive

$p < .01$ (two-tailed)

Observed behavioral gains are positively correlated with all five BEQ domains. The best single domain correlated was Academic Integrity ($r = +0.63$) - a correlation that, although it has the

lowest mean BEQ, indicates how visible the behavioral change that occurs is related to integrity changes. The students with the most self-report growth in the academic integrity demonstrated the biggest observed PBOS gains,

which highlighted the pivotal position of this domain in the overall positive behavioral profiles

at the university level.

11.7 Multiple Regression: Predicting Post-Intervention Behavior

Table 7: Multiple Regression – BEQ Domains as Predictors of Post-Intervention PBOS Score

Predictor	B	SE B	β	t	p
Domain 1 – Academic Engagement	2.14	0.64	+0.26	3.34	.001**
Domain 2 – Participatory Conduct	1.88	0.61	+0.22	3.08	.003**
Domain 3 – Attendance Consistency	1.53	0.59	+0.18	2.59	.011*
Domain 4 – Academic Integrity	3.27	0.73	+0.37	4.48	< .001**
Domain 5 – Peer Cooperation	2.01	0.66	+0.23	3.05	.003**

Model Summary: $R = 0.76$, $R^2 = 0.58$, *Adjusted* $R^2 = 0.55$, $F(5, 74) = 20.40$, $p < .001$

The regression model is statistically significant ($F(5, 74) = 20.40$, $p < .001$) and the regression model accounts for 58% of the variation in the score of PBOS after intervention in the experimental group ($R^2 = 0.58$). Academic Integrity (+0.37) is the best independent predictor, then Academic Engagement (+0.26) and Peer Cooperation (+0.23). Each of the five BEQ domains are important independent predictors of the post-intervention outcome and good performance in positive behavior, which validates the value of each dimension of behavioral engagement experience in producing positive behavioral outcomes overall.

12. Conclusion

The purpose of this study was to answer a question, which had direct implications on the topic of behavioral climate in the University of Gujrat and that is whether structured positive reinforcement is capable of generating significantly higher positive behavioral outcomes among undergraduate students, as compared to traditional classroom management. The response which this quasi-experimental study gives is transparent and empirical sound. The total score

by PBOS of the experimental intervention group of 72.4 points versus the control group of 57.2 is a difference of 15.2 points that ANCOVA can show as statistically significant ($F(1, 156) = 58.34$, $p < .001$) and practically large ($d = 1.12$) despite the pre-existing behavioral differences and gender.

The results of the domain of behavior shed light on how positive reinforcement made these gains. Academic Integrity was found to be the best BEQ Corr predictor of observed behavioral change ($r = +0.63$), as well as the best regression predictor ($\beta = +0.37$). This counterintuitive result, since integrity was scored lowest on the mean BEQ self-rating, could be an artifact of a floor effect because those students who actually changed their academic integrity behaviors due to the reinforcement program reacted radically and noticeably to it, whereas those who did not react to it added relatively little to behavioral gain variance. Academic Engagement had the second highest predictive strength ($\beta = +0.26$), as it has been proposed in the essence of operant conditioning that the first, specific and consistent reinforced behaviors are the strongest reinforced. The fact that the gender effect on the ANCOVA model is not significant implies that the behavioral benefits of positive reinforcement are

equally available to male and female students in the University of Gujrat- a fact of practical value in a setting where gender difference in Pakistani Universities may vary in influencing behavioral pattern of signing up. The token economy system and the publicly visible nature of the peer recognition systems could have been an equalizing factor where positive behavioral expectations and opportunities of reinforcement are explicitly available to all students despite the gender-based norms of participation.

The fact that the regression model accounts for 58% of the behavioral variance within the post-intervention behavior as a result of the BEQ domain scores highlights the fact that the subjective experience of the reinforcement program and not just its objective application was a potent force in personal behavior. Those students who believed that the program was really interested, identifying and developing their behavioral competencies gained the most on the observed behavioral gains. The discovery directly implicates the quality of program design and implementation as the most institutional moderator of positive reinforcement effectiveness - and towards the most fruitful points of refinement of a program, faculty training, specificity of reinforcement, and student voice in setting behavioral goals.

13. Recommendations

13.1 For University Faculty

- Use systematic/specific/ contingent verbal praise as a major behavior management technique. Substitute reactive admonishment with positively acting recognition: recognize the three to five most behaviorally significant positive behaviors in each course (engaged listening, voluntary participation, punctual attendance, original submission, constructive peer feedback) and compliment their presence, each time and once per session.
- Introduce a low-tech academic engagement token system: a visible point bank system where students gain points based on recognizable positive behaviors, and redeem them to get academic amenities (first in sign-up line for individual faculty meetings, bonus faculty

appointments credit) can offer the behavioral specificity, immediacy, and tingling that reinforcement literature sees as most effective with university-aged students.

- Aims: Concentrate on Academic Integrity as a reinforcer: since this experiment has determined that behavioral gains about integrity-related behaviors were the single best predictor of overall positive behavioral profiles, the implication is that faculty intervention to even out behavioral gains on integrity-related behaviors, by design, would create behavioral gains out of proportion to the faculties involved.

13.2 For Student Affairs and Behavioral Support Services

- Plan and establish a Positive Behavioral Support framework university-wide based on the three-tiered PBIS system: universal Tier 1 intervention: reinforcement practices all students (campus-wide behavioral expectations, recognition boards, commendation letters); targeted intervention: reinforcer practice that is tailored to all students who are at risk of behavioral disengagement (structured behavioral goal contracts); intensive intervention: reinforcer practice designed to support students with high behavioral challenges.
- Implement a student Behavioral Recognition Program in which students are publicly recognized as having an exemplary positive behavioral profile: as a social reinforcement, this study identifies that formal recognition ceremonies mentioned in university communications and faculty nomination systems are positively linked to positive behavioral outcomes and are significantly and independently associated.

13.3 For University Administration

- Introduce behavioral reinforcement skills as an obligatory part of the University of Gujrat professional development program: the current research proves that only one day of faculty training in principles and strategies of reinforcement would give rise to a quality of implementation that would create big positive behavioral changes. It is an inexpensive but high impact institutional investment.

- Integrate behavioral climate indicators - positive behavior observations data, rates of disciplinary incidents, and data of student behavioral engagement survey - into the institutional quality assurance checklist of the University of Gujrat, establishing an accountability model to enhance behavioral climate conditions, along with academic achievement outcomes.

13.4 For Future Researchers

- Issues to address during a longitudinal expansion of this study would be to determine whether behavioral benefits of a single-term reinforcement program are maintained over an entire academic year and into subsequent years of study, as well as to test whether behavioral repertoire changes affecting the behavioral benefits of an early reinforcement program are lasting and would be trained through the program.
- Carry out a comparative research on the relative effectiveness of various mechanisms of reinforcement, such as verbal praise, token economies, behavioral goal contracts and peer recognition, in bringing about behavioral change in the context of various populations of students so as to enable the optimization of design of a given reinforcement program in specific contexts at the University of Gujrat.
- Moderating role of cultural factors: To make sure the positive reinforcement framework, which is created and tested deep-rooted in this study, scales to long-term institutional sustainability, measure how different reinforcement strategies respond to the moderating effects of cultural factors in Pakistan, such as collectivist social norms, hierarchical student-faculty relationships, and public- vs. private- behavioral differences in the culture of Pakistani universities.

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