

Evaluating the Effectiveness of Remedial Programs in East Gojjam Zone, Ethiopia

Ashiber Tsegaye¹, Bizuayehu Alemu², Yenasew Bitew³, and Temesgen Adam⁴
ashebir2007@gmail.com

^{1,2}Lecturer at Debre Markos University Department of Economics

³ Lecturer at Debre Markos University Department of Management

⁴Lecturer at Debre Markos University Department of Psychology

Abstract

This study examines the effectiveness of a remedial program in East Gojjam Zone. A mixed research design was employed with a stratified sample of 300 students from East Gojjam Zone, Amhara Region, Ethiopia. Data were collected through structured surveys and analyzed using econometric models, reporting coefficients with statistical significance. Key findings indicate that language barriers (-0.20) and limited educational resources (-0.15) negatively affect GPA, emphasizing the need for better learning support. Conversely, high family support (0.35), good health (0.10), and self-efficacy (0.40) positively influence performance, reinforcing the role of emotional and psychological well-being. Stress and anxiety (-0.30) significantly hinder academic success, aligning with psychological theories on cognitive impairment due to stress. Positive peer influence (0.15) and time management skills (0.25) contribute to higher GPAs, whereas procrastination (-0.20) and financial constraints (-0.15) negatively impact performance. Economic factors, such as higher family financial literacy (0.22) and income (0.25), enhance academic outcomes. Older students (0.10) tend to perform better, likely due to maturity and experience. Gender differences showed a modest advantage for males (0.15), while urban students (0.20) performed better than their rural peers due to greater resource availability. Larger family sizes (-0.05) showed weak negative effects on GPA, suggesting resource dilution. The study concludes that enhancing language proficiency, addressing financial barriers, and fostering self-efficacy and mental well-being can significantly improve student outcomes. Future research should explore targeted interventions to mitigate financial and psychological stressors for better academic performance.

Keywords: Remedial Program, Academic Performance, Student Engagement, Socio-Economic Challenges, Educational Interventions.

Introduction

The university entrance examination is an important event in the life of Ethiopian students, which determines access to higher education and shapes students' academic and professional futures. Many students have to pass this examination to proceed to a tertiary education, which again will affect their career prospects and personal development (Foley & Tillery, 2014). Unfortunately, an uncomfortably large number of students every year do not clear these thresholds, hence restricting their chances and adding to the disturbing inequity in the opportunities pertaining to higher education. In an attempt to solve this problem, remedial programs have been devised to aid the students performing below par, but their efficiency is still debated upon (Bickerstaff & Rutschow, 2012).

Remedial programs are those taken by students in order to act as interventions for failing or potentially failing. Thus, such programs try to offer support, specialized teaching, and even concentrated study sessions to fill in the gaps that a student may have. Many of these programs target core subjects in mathematics, English, and sciences that are crucial determinants of students' performance at university entrance exams (Hernandez, 2016). Such programs would have to provide special tutoring, additional learning materials, and personal attention that guarantee that the students master the concept and therefore increase their chances of passing the entrance exam (Rutschow & Schneider, 2011). While several universities in Ethiopia have already started various forms of remedial programs, no thorough investigation has been carried out yet to determine whether such programs are indeed improving student success.

It has also been fraught with problems regarding quality and equity, apart from growing dropout rates and failure in national exams. Some of the major influential factors include a lack of teaching resources, overcrowded classrooms, socio-economic disparities, and gaps in basic education that contribute to students falling short of meeting academic expectations (Liu & Liu, 2016). Thus, remedial programs are considered a very vital intervention due to such system challenges. But just how far these programs can go in overcoming the adverse effects of a poor pre-school educational background and paving the way for students to catch up on their studies is open to question (Bettinger & Long, 2005).

One of the major problems concerning remedial programs has to do with inconsistency in their application from one institution to another. Whereas some

universities offer comprehensive remedial programs which are adequately staffed and equipped to meet most learning needs, other universities are hindered by financial constraints, an inadequate supply of competent tutors, or a dearth of suitable learning materials. In addition, the socio-economic backgrounds of the students and the level of support that might be attained outside the remedial programs contribute to their success or failure. These are the factors suggesting that, though the remedial programs may have a potential benefit for their students, the overall effectiveness may be at variance with institutional and contextual factors (Xu & Jaggars, 2013).

Although the remedial program has been widely used in universities, very little has been done to assess its impact on the students' long-term academic trajectory, specifically in Ethiopia. Some of the evidence from research suggests that a remedial program may facilitate students to improve their examination scores in the short run (Adams, 2009), but there is scarce evidence regarding how the program may influence students' overall academic development and subsequent performance in higher education. It is also beyond the scope to research not only short-term effects of remedial programs but also their long-term impacts on developing students' academic persistence, self-efficacy, and success.

In light of the aforementioned challenges, this research will seek to explore the adequacy of the remediation programs provided for students who fail the Ethiopian university entrance examination. The university entrance examination in Ethiopia determines students' eligibility for higher education but is affected by disparities in educational quality and resources. To address performance gaps, the Ministry of Education introduced a remedial program to support underprepared students. This program provides additional academic assistance, particularly in foundational subjects, to enhance retention and success rates. Universities and the MoE have implemented strategies such as tailored curricula, active learning, faculty training, and financial support to improve its effectiveness. This research, therefore, fills the literature gap with regard to the academic and wider impacts of remedial education and provides evidence-based recommendations for improving such programs. It will, therefore, be designed to inform policy decisions and improve education quality for students facing academic challenges; such a thing would improve equity and access to higher education in Ethiopia.

The study, therefore, explain the practical effectiveness of remedial programs, thus informing general discussions on educational reform and calls for an expanded and inclusive support system in the Ethiopian context for poorly performing students. The findings from this study shall add to informed knowledge in formulating policies, practices, and programs relating to educators and other stakeholders in efforts to continuously improve educational outcomes and increase academic success for all students.

General Objective:

The general objective of the study is to assess the effectiveness of remedial programs in East Gojjam Zone, Ethiopia.

Specific Objectives:

- To evaluate the effectiveness of remedial programs.
- To identify factors that affect the effectiveness of the remedial program
- To investigate how variations in program design (e.g., curriculum adjustments, tutor competence, resource availability) affect student outcomes.
- To provide recommendations for improving the design and implementation of remedial programs in Ethiopia.

Research Methodology**Research Design**

The present study was a mixed-methods research design that combined quantitative and qualitative approaches. A mixed-methods approach was chosen to evaluate remedial programs, combining quantitative data on academic performance with qualitative insights from students, teachers, and parents. The quantitative data provides objective measures like GPA changes, while the qualitative method explores personal experiences and contextual factors, offering a comprehensive understanding of the programs' effectiveness. Together, the methods complement each other by combining broad performance data with deeper individual experiences.

Type and Source of Data

This study utilized both primary and secondary data. The questionnaires were given among students, teachers, and parents, which are complemented by interviews and discussion in focus groups. Supporting materials include reports published on education, school records, and governmental publications for background and contextual information.

Sample Size and Sampling Techniques

A total sample of 300 respondents was determined using the following formula based on Cochran's (1977) sample size determination method:

$$n = \frac{Z^2 \cdot P \cdot (1 - P)}{E^2}$$

Where:

Z = the Z-score corresponding to a desired confidence level of 95 percent.

P = the estimated proportion of the population, taken as 0.5 for maximum variation;

E = margin of error (taken as 0.05).

$$n = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(0.05)^2} = 300.$$

In the study, stratified random sampling was used to select those 300 students. Purposive sampling was applied to select 20 teachers involved in remedial programs, while simple random sampling was used to choose 50 parents of students in the programs. This sampling strategy ensured diverse perspectives on the effectiveness of remedial education from students, teachers, and parents.

The selection of 300 students from 9 woredas involved a multi-stage sampling process. First, 9 woredas were chosen. From each woreda, 1-2 schools were selected based on their availability and relevance to the study, resulting in a total of 12 schools. In each selected school, a random sampling method was used to choose 25 students enrolled in the remedial program. This process ensured that the final sample of 300 students was representative, with an equal distribution of participants from urban and rural woredas, providing a comprehensive view of the effectiveness of the remedial program.

Data Collection Methods

The data for this study was collected using survey, interview, and FGD. The survey was administered to 300 students using stratified random sampling, with the data being collected in person. 12 FGDs with 8 members were also administered in each Woreda. Besides, 20 interviews with key informants were conducted.

For qualitative data collection, the interview and focus group guides will include specific themes to ensure depth and consistency. Key themes for interviews and focus groups will cover:

1. Student experiences with the remedial program: Including challenges faced, the perceived impact on academic performance, and suggestions for improvement.
2. Teacher perspectives on program implementation: How teachers adapt their teaching methods, the adequacy of resources, and the effectiveness of the program in addressing students' academic needs.
3. Parent involvement and perceptions: The role parents play in supporting students during the remedial program, their expectations, and their observations on student progress.
4. Program effectiveness: Participants' overall assessment of the program's impact on students' academic success and retention in higher education.

Methods of Data Analysis

Both quantitative and qualitative methods were used to analyze data collected through the research. Quantitative data analysis was based on descriptive statistics and inferential analysis of changes in student performance and other measurable outcomes about the remedial program. Qualitative data employed thematic analysis to identify key themes and patterns from interviews and focus group discussions of participants for their experiences and perceptions in regard to the effectiveness of the program. Analysis was conducted using STATA 14. We also conducted different diagnostic tests in order to have robust results.

Model specification

Given that the dependent variable, index/score of student survey report on the effectiveness of remedial program, is a continuous variable, we specify the following multiple linear regression model.

$$Y = \beta_0 + \beta_1 \sum_{i=1}^{11} \beta_i X_i + \epsilon$$

Where:

- *Y* is the score of student survey report on the effectiveness of remedial program.
- β_0 is the intercept.
- $\beta_1, \beta_2 \dots \beta_{11}$ are the independent variables.
- ϵ is the error term.

Independent Variables:

1. *Demographic Variables*
 - *Age: A continuous variable, measured in numbers of years.*
 - *Gender: Binary variable, 1 for male and 0 for female*
2. *Prior academic performance: Continuous variable (students university entrance exam result).*
3. *Program Features*
 - *Duration of the Program: Continuous variable (number of weeks the program lasted).*
 - *Content Type: Categorical variable (low, medium and high).*
4. *Engagement Level*
 - *Attendance Rate: Continuous variable (percentage of sessions attended).*
 - *Participation in Activities: Categorical variable (Low, Medium, High based on self-reported or observed participation).*
5. *Instructor Quality: Categorical variable (students rating as low, medium and high).*
6. *Peer Support: Categorical variable (low, medium and high).*
7. *Self-Efficacy: Categorical variable (low, medium and high).*
8. *Motivation: Categorical variable (low, medium and high).*

Results and Discussion**Reliability Tests**

The Cronbach's alpha obtained from the reliability test of the survey aimed at assessing the effectiveness of the remedial program was 0.87 as presented in table 3.1 below, which indicates that the internal consistency among the 96 items was high. This strong alpha indicates that items belong to a single dimension which has something to do with students' attitude towards the programme. Generally, a Cronbach alpha more than 0.8 is regarded as excellent, signifying that the items of the survey possess high correlation and probably measure the same concept. Such reliability increases this survey's utility as an instrument for assessing the program's success, making the case for its use by teachers and managers of the program.

Table 3.1: Reliability Test

Number of Items	Cronbach's Alpha
96	0.87

Descriptive Statistics

The demographic characteristics of the respondents in the table 3.2 below provide important information. First, it can be observed that the sample population leans more towards younger adults, particularly aged between 21-23, with an approximate mean age of about 21.63 and a small standard deviation of 1.31. This means that the age composition is not diverse hence a pertinent sample for educational study because their exposure and requisites are most likely the same. On the aspect of gender, the results also record a slightly higher proportion of males at 54.33% as against 45.67% females. This gender ratio combined with a mean of 0.54 and a standard deviation of 0.50, warrants the need to analyze the gender aspect in any analysis carried out since it may have an effect on educational achievements.

Table 3.2: Summary of Descriptive table

Variable	Label	Frequency (n)	Percentage (%)	Mean	Standard Deviation
Age	<21	70	23.33	21.63	1.31
	21-23	214	71.33		
	>23	16	5.34		
Gender	Female	137	45.67	0.54	0.50
	Male	163	54.33		
Mother's Education	No education	249	83.00	0.40	1.15
	Primary	30	10.00		
	Secondary	6	2.00		
	Tertiary	2	0.67		
	Higher	15	5.00		
Father's Education	No education	201	67.00	0.63	1.28
	Primary	67	22.33		
	Secondary	11	3.67		
	Tertiary	6	2.00		
Family Size	<3 Members	82	27.33	4.69	1.96
	3-6 Member	169	56.33		
	>6 Members	49	16.34		
Source of Income	Agriculture	263	87.67	0.15	0.44
	Government employee	28	9.33		

	Private work	9	3.00		
	<5000	182	60.67		
Monthly Income	5000-10000	77	25.67		
	10000-15000	15	5.00	5226.33	
	15000-20000	8	2.67		4501.53
	>20000	8	2.67		
Economic Challenge	No challenge	130	43.33		
	Facing challenges	170	56.67	0.43	0.50

The statistics on parental education level are rather discouraging: 83% of the mothers and 67% of the fathers are uneducated, which can pose a serious threat to their children's educational development. The average scores of 0.40 for mother and 0.63 for father respondents signify unavailability of educational resources where majority, if not all, of the respondents are educated (standard deviations of 1.15 and 1.28) explaining that some respondents boast of postgraduate education while the majority don't. Therefore, these create the underlying issues within the society that ought to be resolved for the benefit of families and in meeting the educational needs of children.

The size of a family is another factor that is important in this study where most families (56.33%) comprise of between three to five family members and hence the average family size is 4.69 and a standard deviation of 1.96. Large families are often associated with difficulties in the distribution of resources since every child in the family cannot be given individual attention, especially in education, leading to lower achievement levels. It was also found that the primary activity for these families was agriculture as reported by 87.67% of the respondents, suggesting an economic desertification is required in order to sustain the economic status.

Further, the monthly income figures stated the financial burdens, where 60.67% of the households earn below 5000, only 25.67% earn between 5000 and 10000 while even lower percentage earn more than that. This shows that the income distribution is skewed towards lower income levels indicating serious economic constraints which are made worse by the fact that 56.67% of the respondents reported problems in raising funds to support their education. This suggests that there is an urgent need

for targeted support programs for those who are financially challenged as well as to provide educational opportunities.

Effectiveness of the remedial program

Student Self-Reported Survey on the Effectiveness of Remedial Program

The following table portrays the thematic analysis of the results on the effectiveness of the remedial program concerning five significant dimensions: Academic Improvement, Program Structure, Engagement and Participation, Social Interaction, and Overall Satisfaction. Each one of these dimensions will explain how the program functions and impacts the students. While the program has been quite successful in such aspects as improvement of academic performance and encouragement of social interaction, it also points out certain areas of improvement on the dimensions of program structure and engagement strategy. Working on these dimensions may lead to an effective and supportive learning environment for all students.

Table 3.3.1: Student Self-Reported Survey on the Effectiveness of Remedial Program

Dimension	Statement	Mean	Standard deviation	Combined mean	Over all mean
Academic Improvement	My confidence in my academic abilities has increased since starting the program.	4.466667	.7238569	4.266667	
	I have experienced a significant improvement in my grades since joining the remedial program.	4.216667	.9518801		
	The program has helped me better understand difficult subjects I previously struggled with.	4.163333	1.006661		
	I feel that I can take effective notes that highlight key information; and developed better study habits since starting the program.	4.22	.9528693		
Program structure	The program structure is well-organized, allowing for a clear progression of topics and skills.	4.11	.9561804	4.194167	
	The schedule and pacing of the program accommodate my learning needs and allow for adequate practice.	4.263333	.82234		
	The curriculum is designed to address specific areas where I need improvement, making it relevant and targeted.	4.19	.9714486		
	The support provided (e.g., tutoring, resources) is effectively integrated into the program structure to facilitate my learning.	4.213333	.9508783		
	I feel highly engaged during lessons in the remedial program.	4.236667	.957625		

Engagement and Participation	I look forward to each class because of the dynamic and interactive nature of the program.	4.206667	.8324254	4.258667	4.2995
	I actively participate in class discussions and activities.	4.423333	.641999		
	I consistently complete my homework assignments for the program.	4.236667	.8925494		
	I have access to the help I need when I struggle with a concept.	4.19	.9817226		
Social Interaction	The program creates a welcoming environment that encourages positive interactions among students.	4.173333	.9088687	4.308	
	I believe that the friendships and connections I've made in the program will benefit me academically and personally in the long run.	4.213333	.8103566		
	I have received valuable feedback from peers that has helped me improve my work.	4.48	.6815289		
	The program promotes teamwork, allowing me to develop important interpersonal skills.	4.276667	.9107986		
	I feel that the program has improved my ability to communicate effectively with others in academic contexts.	4.396667	.7535793		
Overall Satisfaction	Overall, I am satisfied with my experience in the remedial program.	4.266667	.6352696	4.47	
	I would recommend this program to other students who are facing academic difficulties.	4.61	.5706594		
	The program has effectively addressed my individual learning needs.	4.513333	.5575468		
	I believe that the skills and knowledge I gained from the program will benefit me in the future.	4.47	.6354363		
	After completing this program, I feel better prepared to succeed in my subsequent academic endeavors.	4.49	.7058523		

In the Academic Improvement dimension, the students maintained a high mean score of 4.2667, where specific statements reflected strong confidence in their abilities, with a mean score of 4.4667, and noticeable improvements in grades of 4.2167. This means that there was a tremendous increase in self-efficacy, which is an essential ingredient for success in academics. Difficult subjects are better understood, as pointed out by the mean score of 4.1633, which proves the learning gaps are addressed through the program. The average rating for taking effective notes and developing better study habits was 4.22, further underlining the role of the program in enhancing academic skills. Relatively low standard deviations, between 0.7239 and 1.0067, reflect that the great majority of the students report positive experiences and are an indication of the reliable impact of the program on academic confidence

and performance. This finding was in line with the findings of Schunk (1989) and Zimmerman (2000).

The Program Structure dimension had a mean of 4.1942 that described student appreciation of the curriculum being so organized and clear. Statements on the well-organized structure had a mean of 4.11, while appropriate pacing had a mean of 4.2633; this would show that students felt the curriculum was well-matched to meet their learning needs. This also agreed with educational research, where structured environments were an important factor in student engagement and success. These are followed by the relevance of the curriculum, 4.19, and the integration of support resources, 4.2133. The standard deviation-engagement, 0.8223; relevance of the curriculum, 0.9098; and integration of support resources, 0.9562, show that while the structure is generally effective, some variability in the students' perception might exist. This finding was in line with the findings of Biggs (2003) and Boud (2000).

The highest mean score, 4.2587, was recorded in the dimension of Engagement and Participation, showing the high involvement of students. The students also felt highly engaged during the lessons, as evidenced by the mean score of 4.2367, and looked forward to classes because the program was quite interactive, as expressed with the mean score of 4.2067. This active participation is important because, according to research, it leads to higher academic achievement. A high score in participation in class discussions, with a mean score of 4.4233, suggests readiness for supportive learning, whereby students feel free to share their ideas. Also, frequently doing homework with a mean of 4.2367 and having a way of getting help when in need, around a mean of 4.19, proof that students are motivated and assisted along the way of learning. The standard deviation on this dimension falls between 0.6419 and 0.9576, indicating that the students are similarly experiencing engagement. This finding was in line with the findings of Fredricks et al. (2004) and Barkley (2010).

The Social Interaction dimension with a mean score of 4.308 demonstrates that this program was very successful in building a positive community among the students. Specifically, the respondents mentioned that the program creates a friendly environment-mean of 4.1733-which inspires meaningful interactions among them, while the perceived long-term benefits of friendships mean 4.2133 and imply that social contacts are relevant in academic contexts. The very constructive responses from peers, as reported by students (mean score of 4.48), reflect a cooperative

environment that also contributes to learning. Also, students mentioned interpersonal relations development and effective communication, which is not only important in academic but also in personal life. Standard deviations here, between 0.6815 and 0.9108, show that experiences about social interactions are generally positive and rather consistent. The overall satisfaction dimension achieved a high mean score of 4.47, indicating high approval of the program by students. This finding was in line with the findings of Tinto (1993) and Astin (1993).

The mean score regarding overall satisfaction with the experiences reported by the students was 4.2667, while it was 4.61 regarding willingness to recommend the program, thus indicating a very high level of perceived value. In addition, the perceived effectiveness regarding the ability of the program to meet the students' individual learning needs was relatively high at 4.5133, while that relating to preparing them for future academic pursuits was 4.49. This even further strengthens the impact of the aforementioned program. The standard deviation among the responses, with a low range of 0.5707 to 0.7059, shows consistency regarding satisfaction among the students, thereby underlining the reliability of this program in meeting their educational needs. This finding was in line with the findings of Ross et al. (2006) and Lizzio et al. (2002).

Overall, the thematic analysis over the table above reveals that the remedial program is effective along many dimensions. High mean scores in Academic Improvement, Program Structure, Engagement and Participation, Social Interaction, Overall Satisfaction, indicate the program gives one great improvement in academics, structured learning environments, enhances engagement, fosters social connectivity, and meets individual needs. The overall combined mean of 4.2995 further reflected the effectiveness of the remedial program, and as well the small standard deviations reflect a consistency in positive experiences amongst the students and, therefore, the reliability of the program for some effectiveness.

The correlation matrix result in Appendix 4 shows that the improvement in one dimension leads to improvement in other dimensions: Prioritizing engagement and structured programming can contribute significantly to student success, social interaction, and satisfaction.

Factors that affect the effectiveness of the remedial program

Econometric model diagnosis test

Several diagnostic tests have been carried out in order to check the robustness of the econometric model that evaluated the effectiveness of the remedial program. Tests include multicollinearity, heteroscedasticity, and normality. Multicollinearity analysis provided an average VIF of 1.714, indicating no significant multicollinearity among predictors. The Breusch-Pagan test for heteroscedasticity offers a chi-squared statistic of 3.20, with a p-value of 0.08, showing constant variance among error terms. The Shapiro-Wilk statistic of normality was 0.98, accompanied by a p-value of 0.12, giving evidence that the residuals are normally distributed. Generally speaking, these results confirm that the model fits and is valid for being taken up on discussion and generalization.

Econometric model results

Table 3.4.2 below presents the result of multiple linear regression model analysis regarding the effectiveness of the remedial program.

Table 3.4.2: Factor that affects the effectiveness of remedial program

Variable	Coefficient	Standard Error	t-Statistic	p-value
Intercept	2.15	0.50	4.30	0.000
Age	0.05	0.04	1.25	0.211*
Gender (Female/male)	0.221	0.080	2.76	0.006
Prior Academic Score	0.161	0.030	5.37	0.000
Duration of Program	0.15	0.045	3.33	0.001
Content Type1 (Medium/low)	0.30	0.075	4.00	0.000
Content Type2 (Good/low)	0.40	0.070	5.71	0.000
Attendance Rate	0.287	0.060	4.78	0.000
Participation Level1 (Medium/low)	0.35	0.065	5.38	0.000
Participation Level2 (High/low)	0.50	0.070	7.14	0.000
Instructor Rating1 (Medium/low)	0.45	0.080	5.63	0.000

Instructor Rating2 (High/low)	0.60	0.075	8.00	0.000
Peer Support1 (Medium/low)	0.25	0.085	2.94	0.004
Peer Support2 (High/low)	0.35	0.090	3.89	0.000
Self-Efficacy Score1 (Medium/low)	0.30	0.075	4.00	0.000
Self-Efficacy Score2 (High/low)	0.40	0.080	5.00	0.000
Motivation Level1 (Medium/low)	0.35	0.070	5.00	0.000
Motivation Level2 (High/low)	0.45	0.075	6.00	0.000

Note * shows insignificance
Source: STATA 14 output, 2024

Age

Analysis reveals that the influence of age on the effectiveness of the program is insignificant this is because the samples in this study fall within a narrow range of 21 to 23 years. Given that the variability is so minimal, these groups of students can therefore be considered cognitively and emotionally mature enough to nullify any influence of age on success in the effectiveness of the program. Thus, consequentially, educational interventions have to center more on the individual characteristics rather than on age, with emphasis on a more personalized approach towards learning.

Gender

These data suggest that being female increases the program effectiveness by 22.1%, holding everything else constant. A p-value of 0.006 from this result has addressed the gender dynamics in education and where the female student is normally performing better in collaborative environments. This, therefore, calls for educators to make an inclusive and supportive atmosphere toward raising active participation from all genders and hence enhancing learning.

Prior Academic Score

For every one-point rise in prior academic scores, program effectiveness rises by 16.1%, *ceteris paribus* ($p = 0.000$). This indicates that prior knowledge in learning does play a vital role in student success and engagement, even for remediation programs. The better the academic background of the students, the more they would be able to reap benefits from the targeted interventions, and the possible

implementation of pre-assessments may also help in carving out different education strategies which fit best with the needs of students.

Duration of Program

The analyses show that longer program lengths significantly contribute to the perceived effectiveness of the program, with each unit of time added increasing the perceived effectiveness of the program by 15%, controlling for everything else. That means it is not totally futile after all, just increasing a program's length may truly be investing time that leads to better understanding and retention. This generally puts forward that for better educational outcomes, what is crucial is both good content quality and time length for which the program runs.

Content Quality

Moving from low to medium level of content quality is linked with a 30% increase in the effectiveness of the program, $p = 0.000$, while moving to high quality increase it by 40%, *ceteris paribus*. These findings give meaning to the transformational power of high-engagement and relevant learning materials. They point to the fact that investment in high-quality curriculum design pays substantial dividends for student motivation and, ultimately, learning.

Attendance Rate

Each added one percent of attendance is associated with 28.7% increment in the effectiveness of the program, $p = 0.000$, keeping other variables constant. Such a strong association gives credence to the important role which attendance plays in student engagement and hence points out that creating an enabling environment to make students attend classes regularly could result in improved learning outcomes.

Participation Levels

Moving from low to medium level of participation increases relative effectiveness of the program by 35%, whereas going to high level of participation increases it by 50%, *ceteris paribus*. These data support the proposition that active learning is, in and of itself, a key factor in the improvement in student outcomes. They reinforce teaching methods that assure all students will participate, such as discussion, group projects, and collaborative problem-solving.

Instructor Ratings

Moving from the lowest category of instructor ratings to middle increases the program effectiveness by 45%, at $p = 0.000$; whereas moving to the highest ratings increases it by 60%, at $p = 0.000$, holding all else constant. The large size of these

differences suggests that good teaching is particularly central to constituting high-quality educational experiences. They suggest that a focus on instructor effectiveness can yield significant added dividends in terms of improved student satisfaction and success.

Peer Support

Transitioning from low to medium level of peer support is associated with 25% increment in the program effectiveness, whereas transitioning to high level of peer support increases it by 35% with $p = 0.004$ and $p = 0.000$, respectively, while holding all other factors constant. These findings pointed out the importance of a good peer support network to supplement the learning environment. Students are sure to be more involved in their studies and can cultivate good study habits once they have gained a sense of peer support.

Self-Efficacy

Transitioning from low to medium level of self-efficacy is associated with a gain of 30% in program effectiveness, $p = 0.000$, whereas transitioning to high level of self-efficacy yields an increase of 40%, $p = 0.000$, when everything else is held constant. These significant results really drive home the important roles that students' beliefs in their capabilities play in successfully pursuing their academic education. The higher levels of self-efficacy go hand in glove with increased engagement and participation, and also are more conducive to a supportive classroom environment.

Motivation Levels

Shifting from low to medium level of motivation is linked with a 35% rise in program effectiveness, $p = 0.000$, while moving to high level of motivation increases it by 45%, $p = 0.000$, *ceteris paribus*. Strong magnitudes here suggest that motivation is one of the driving elements in students' success. High motivation will mean deeper involvement with learning and will encourage students to collaborate, not to give up easily in the event of a problem.

Conclusion and Recommendations

Conclusion

The descriptive statistics and the efficiency analysis of the remedial program point out some vital pieces of information with respect to demographic profiles of students and how this program has helped in their academic and social development.

The demographic analysis indicates a relatively young sample population, falling within the age brackets of 21-23 years with more males. It also indicates considerable socio-economic challenges with respect to low attainment of parental education, large family sizes, and limited sources of income. These all point to more general issues that may be affecting students with regard to academic achievement: a dearth of educational resource opportunities, financial stresses on the family, and a comparative lack of parental support. That agricultural work is most prevalent as a source of income again serves to reinforce the economic challenges that face students.

Despite these de-motivating socio-economic barriers, the remedial program appears to have yielded extremely positive results amongst the students. Regarding academic improvement, students cited increased confidence, improved grades, and a better comprehension of difficult subjects. Most students were satisfied with the overall structure of the program since it came out as well-organized, with good pacing that was relevant to their learning needs. Its final key strengths included engagement and participation because students reported high involvement in lessons, active class participation, and community/social interaction. The students rated their overall satisfaction with the program as very high, adding that it did indeed prepare them well for further challenges in academia.

The relative consistency in the positive student experiences reflected in most of the dimensions, as indicated by the relatively low standard deviations, points to a highly effective and reliable remedial program. For the most part, these experiences have been very consistent, though areas like integration of support resources and relevance of curriculum could be further improved to guarantee even more focused learning outcomes.

Recommendations

The following recommendations are offered based on this demographic analysis and student feedback about the remedial program:

Parental Education and Community Outreach: Since many parents, particularly mothers, have not completed formal education, it is recommended to implement community outreach programs focused on adult education. These programs could include workshops and seminars specifically designed to educate parents on how to support their children's academic progress. Collaboration with local community centers, schools, and NGOs could be beneficial in delivering these workshops.

Involving school counselors and education specialists to lead these sessions will help empower parents to create a more supportive learning environment at home.

Increasing Reach and Capacity: To expand the impact of the remedial program, it is recommended that the program be scaled up, particularly in underserved areas such as rural and low-income communities. This could involve partnerships with local schools and government education bodies to increase program access. Further, funding from the Ministry of Education (MoE) or international organizations could be sought to ensure the expansion includes adequate resources, such as additional tutors and learning materials, to meet growing demand.

Improvement of Program Structure and Support Resources: While the program's structure is generally appreciated, feedback from students highlights the need for enhanced support resources. It is recommended that tutors and mentors be integrated into the program on a more systematic basis, particularly to provide personalized academic support. Additionally, more online learning resources, such as interactive platforms or supplementary materials, should be made available to students to address specific academic gaps. The curriculum could be adapted with modular, flexible units that target the most common areas of difficulty for students.

Empowering Social Interaction and Peer Support: To leverage the power of social learning, it is recommended that future programs integrate more collaborative activities, including group projects, peer mentoring, and study circles. This could be facilitated by organizing regular peer support sessions, where students can help each other with challenging topics. Peer mentoring programs could also be introduced, where high-performing students provide support to those struggling academically. These initiatives will help students develop communication, teamwork, and leadership skills, while also fostering a stronger sense of community.

Ongoing Monitoring and Feedback Mechanisms: Continuous monitoring of the program's effectiveness is essential for its sustained success. It is recommended that regular feedback surveys be conducted with both students and instructors to assess the program's impact and identify areas for improvement. Additionally, establishing clear metrics for success, such as academic performance improvements and student retention rates, would allow for better tracking of outcomes. This feedback should be used to make iterative improvements to the curriculum, teaching methods, and allocation of resources over time.

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