Teacher Self-Efficacy as a Correlate of Academic Achievement Among Grade Seven Learners in Botswana.

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ABSTRACT

Primary school academic achievement forms the foundation for societal progress and individual development of cognitive, emotional, and social competencies. However, in Botswana's Kweneng Region, Primary School Leaving Examination (PLSE) scores have declined from 2018-2022. This is despite government interventions and stakeholder efforts to raise educational standards. While psychological predictors of academic achievement have been studied in Western countries, little research has been done in Botswana on how teacher self-efficacy and task motivation impact student performance. Therefore, this study aimed to investigate the correlation between teacher self-efficacy and the academic performance among grade seven learners. The study adopted a descriptive correlational design. A sample of 190 teachers were randomly selected from a core of 293 grade seven teachers in Kweneng region. Data collection was by filling questionnaires. The Teacher Self-Efficacy Scale was used to measure academic achievement whereas, academic achievement was measured using performance records. Bivariate correlational analyses established a significant weak but positive correlation between teacher self-efficacy and students' academic achievement, $r (198) = .20$ $p < .01$. The findings of the study have key implications to practice, especially on teacher training to bolster teacher self-efficacy through professional development programs

Keywords: Teacher self-efficacy, primary education, classroom management, instructional strategies, academic achievement.

INTRODUCTION

Primary education has been seen as the foundation of societal advancement. Primary education provides abundance of opportunities not only for the development of the learners' social, cognitive and emotional competencies but also has been regarded as a vehicle for the reduction of intergenerational poverty (Yan, 2019). It is for these reasons that academic achievement in primary education has been in the spotlight with regard to research, policy formulation and practice. Efforts to support basic education uptake and quality of achievement have been reflected more especially in the Sustainable Development Goals (SDG 4). Hanemann (2019) points out that the goal to attain basic numeracy and literacy skills by the year 2030 through compulsory primary education has been championed more especially in the developing world.

Academic achievement in primary school education is crucial for advancing to higher levels of education and is considered a significant indicator for evaluating educational systems and policies (Carrillo-Lopez et al., 2022). It is a tool used to promote learners to subsequent educational stages, secondary schools and tertiary institutions. Academic excellence in primary education holds substantial value in society, leading governments and parents to invest substantial resources in preparing learners for success at this level (Herrera & Mohamed, 2020).

Despite global efforts to improve primary education, academic achievement remains a significant challenge worldwide, particularly in developing regions. The United Nations Educational, Scientific and Cultural Organization (UNESCO) reports that 617 million children and adolescents are not achieving minimum proficiency levels in reading and mathematics (UNESCO, 2017). This crisis in learning is even more acute in Africa, where over 85% of children are not meeting minimum reading and mathematics proficiency levels by the end of primary school (World Bank, 2019).

The Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) consistently highlight disparities in academic achievement across countries, with many African nations ranking at the bottom (OECD, 2019; IEA, 2020). In sub-Saharan Africa, the situation is particularly dire, with the World Bank's Human Capital Index indicating that a child born in the region will be only 40% as productive as they could be if they had complete education and full health (World Bank, 2020). Equally, Botswana has recorded poor academic achievement levels in the primary to secondary school transition examination; the Primary School Leaving Examination (PSLE). The Botswana Education Council notes that most of the regions in the country struggle to achieve an 80 percent pass rate.

Students' and teachers' psychological variables are often left underexplored in the African Educational context. Instead, focus has mainly been on social economic barrier and the inadequacy of learning resources. To address this gap, the study focuses on the relationship between teacher self-efficacy and academic achievement.

Teacher Self-Efficacy

Teacher self-efficacy refers to a teacher's belief in his or her capacity to plan and carry out the steps necessary to complete a task in a given setting (Ninkovic & Floric, 2018). Efficacious teachers have confidence in their abilities to deal with their jobs, commitments, and difficulties (Barni et al., 2019). According to Lazarides and Warner (2020), teachers with a high level of self-efficacy are more open to new teaching methods, set challenging goals and demonstrate a higher level of planning and organization. Additionally, they enjoy problem-solving, and can modify their teaching strategies when they encounter problems or difficulties. In another investigation, Fackler et al. (2021) revealed that classroom management, instructional strategies, and student engagement are all impacted by the teacher self-efficacy.

Teacher self-efficacy focuses on teachers' ability in classroom management, utilization of instructional strategies and in student engagement (Sokmen, 2021). Self-efficacy in classroom strategies relates to the teacher's belief in their ability to control disruptive behaviours in the classroom and maintaining orderly learning environment. Self-efficacy in instructional strategies, on the other hand, relates to the ability of the teacher to show confidence in their ability to implement effective learning methods and strategies that can enhance the students' engagement. Lastly efficacy in student engagement pertains the ability to motivate and engage students in the learning process (Lazarides et al., 2020).

Alibakhshi et al. (2020) assert that self-efficacy in teachers can increase their motivation and enthusiasm for carrying out their teaching duties. Effective instructional strategies, positive classroom management, high expectations for students, and the ability to motivate and engage learners in the educational process. They claimed that the greater a teacher's self-efficacy in terms of instructional strategies, classroom management, and student engagement, the more satisfied they are with their duties and career. They were able to complete their task and achieve their objective due to their self-confidence.

Whereas teacher self-efficacy has been expected to yield incremental learning outcomes, nonetheless, there has been mixed findings. For instance, Chen et al. (2023) observed that high teacher self-efficacy positively impacted student motivation but not academic performance. This was potentially due to the pathways in which teacher beliefs translate to student outcomes. Non-significant findings were found, for instance in the case of Zee and Koomen (2022) who established that there was significant relationship between teacher self-efficacy and reading comprehension scores which points to the centrality of contextual variables in the relationship.

In Botswana, literature on psychological variables accounting for the poor performance are evidently old (Dibapile et al., 2012; Moalosi & Forcheh 2015; Magonwe & Oliever, 2007). The current teaching and

learning environment are majorly characterized by authoritative and modestly controlling environments (Lumadi &Awino, 2009). While high self-efficacy generally leads to better student engagement and performance, the authoritative nature of these settings may limit students' autonomy, potentially dampening these positive effects (Olivier et al., 2019). Teachers who are confident in their abilities may still struggle to achieve desired outcomes if their controlling approach stifles student motivation. Unfortunately, little research has been done on the role of teacher variables like teacher self - efficacy and motivation on learner's achievement in Botswana. Against the above, the current study sought to assess how gaps in academic achievement were linked to teacher self-efficacy.

MATERIALS AND METHODS

Research Design

The study used a descriptive correlational research design. The design allows to measure the relationships among the variables without interfering with causality (Bhandari, 2023). This is especially important since manipulation of the variables under study would not be possible for ethical reasons (Fiedler et al., 2021).

Participants and Procedures

The study used a random sample of 190 (118 female, 72 male) grade seven teachers across 37 schools in the Kweneng Region of Botswana. Sampling was delimited to grade seven teachers in the region who were purposively targeted in the study due to persistent subaverage performance. Out of the available pool of 293 teachers, the 190 teachers were selected using simple random sampling. This was key as it minimizes sampling bias and ensures greater levels of representation (Iliyasu et al., 2020). The teachers ages ranged between 27 to 64 years with an average of 45.98 (SD = 7.52). Study procedures involved the administration of a paper and pencil questionnaire with Likert scale items. The questionnaires were administered in person by the researcher during normal working hours.

Instruments

The Teacher Efficacy Scale - Short Form (Tschannen-Moran & Hoy, 2001)

This adapted tool was employed to determine the level of teacher self - efficacy. It was a nine-point Likert scale, with the range being "nothing" (1) to "a great deal" (9). The 12 items in the short-form version were used. The instrument measured levels of self - efficacy across three domains. Classroom management (items 1, 6, 7, and 8), student engagement (items 2, 3, 4 and 11), and instructional strategies (items 5, 9, and 10 and 12) are all measures of a teacher's self - efficacy. Recent validation studies have established the instrument to have convergent validity and reliability ranging from Cronbach Alpha (α) 86 to 90 on diverse samples (Yough, 2019). Scoring involved the computation of average scores for each dimension as well as for the whole scale, which high scores were interpreted as higher levels of teacher self-efficacy.

Proforma Summary of students' Academic Results

Academic results were obtained from learners' academic records. Grade seven results from term one and term two examinations in year 2023 were obtained from the respective teachers and the average scores for the two terms were computed. The mean scores were transformed to standard Z scores, and thereafter into T scores. This was done to make the results comparable across the schools that participated in the study.

DATA ANALYSIS AND DISCUSSION OF FINDINGS

The collected data were keyed into the SPSS V28 software. Thereafter, data cleaning, testing of assumptions and descriptive analyses were performed prior to testing of multivariate relationships.

Reliability of the Instruments

The reliability of the research instrument was measured using Cronbach Alpha internal consistency

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Table 1: Reliability Coefficients of the Instrument

Scale	No of Items	Author's α	Obtained α
The Teacher Efficacy Scale - Short Form	12	.90	.85

As outlined in Table 1, the teacher self-efficacy scales had a reliability coefficient above the acceptable level of α = .70 and above (Kennedy, 2022).

Descriptive Analyses

Descriptive analyses of the variables were performed, and the findings highlighted in Table 2.

Table 2: Descriptive Analyses

Scale	Range	M	SD	Sk	Kur
Teacher Self Efficacy Scale	4.79 – 9.00	7.78	0.84	-1.17	1.64
Academic achievement (Raw)	18.00 – 92.00	57.66	16.49	-0.30	- 0.44
Academic Achievement (T Score)	26.46 – 72.76	50.00	10.00	-0.30	- 0.44

Table 2 shows that the teachers had a notably high average score of 7.78 (SD = 0.84) on teacher self-efficacy. Further, academic achievement levels were slightly above average (M = 57.66, SD = 16.49) with great variability from the mean. Both variables had a negative skew, an indication that a majority of teachers had higher teacher self-efficacy and academic achievement above the average. Skewness and kurtosis values in both variables are in accordance with the benchmarks recommended for a normal distribution (Demir, 2022) of ± 1 and ± 10 for skewness and kurtosis values respectively.

Further, the scores on the three subscales of the teacher self-efficacy scale were analyzed. Findings are outlined in Table 3.

Table 3: Descriptive Analyses on the Teacher Self-Efficacy Subscales

	N	Range	Min	Max	M	SD	Sk	Kur
CM	190	4.25	4.75	9.00	7.89	0.92	-0.96	0.71
SE	190	6.00	3.00	9.00	7.82	0.86	-1.48	4.72
IS	190	5.63	5.63	9.00	7.64	1.08	-1.24	1.81

Note. CM = Classroom Management; SE = Student Engagement; IS = Instructional Strategies

Table 3 shows that teacher self-efficacy was highest in classroom management (M = 7.89, SD = 0.92) and lowest in instructional strategies (M = 7.64, SD = 1.08). The range of scores was, however, highest in teacher efficacy in student engagement (Range = 6.0).

Hypothesis Testing

The study sought to establish the relationship between teacher self-efficacy and academic achievement. To test the objective, the following null hypothesis was tested.

H_0: The is no significant relationship between teacher self-efficacy and academic achievement among grade seven students in Kweneng Region, Botswana.

Before performing the test, a scatter diagram was used to assess the likelihood of outliers and to graphically

assess the linearity assumption. Figure 1 depicts this relationship between academic teacher self-efficacy and academic achievement.

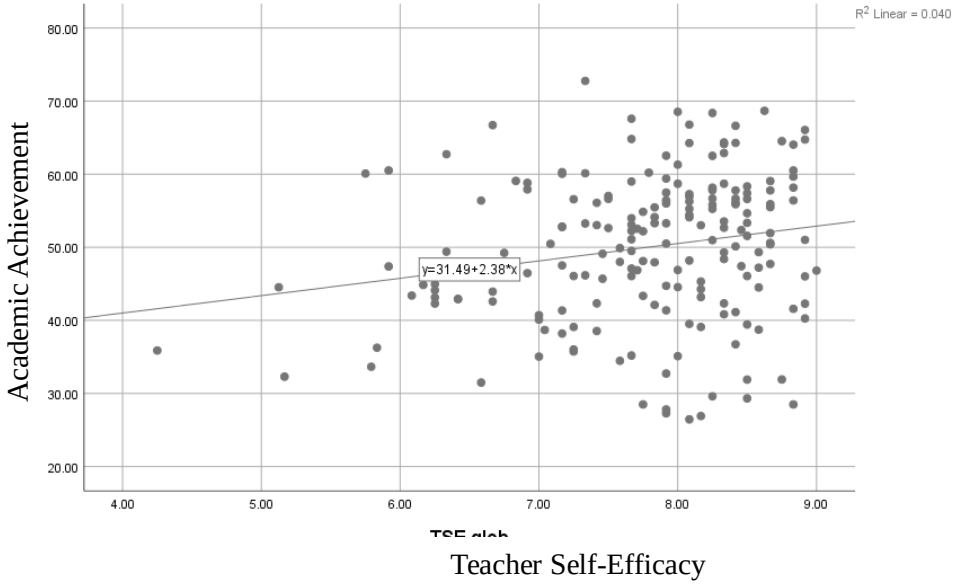

Figure 1: Relationship Between Teacher Self-Efficacy and Academic Achievement

The distribution of score shows that the scores had a linear distribution and there were no absolute outliers in the variables. From the figure it can be deduced that there was a weak effect size of $r^2 = .04$. Having satisfied the assumptions, the hypothesis was subsequently tested using a Pearsons' Product Moment Correlation Coefficient, and findings presented in Table 4.

Table 4: Relationship Between Teacher Self-Efficacy and Academic Achievement

Academic Achievement	r	Df
Classroom Management	.15*	188
Student Engagement	.11	188
Instructional Strategies	.24**	188
Teacher Self-Efficacy	.20**	188

Note. ** = Correlation significant at .01 level (2-tailed); * = Correlation Significant at .05 level (2 – tailed)

As noted in Table 4, there was an overall significant weak positive relationship between teachers' self-efficacy and students' academic achievement score; r (188) = .20, p < .01. Thus, the null hypothesis was rejected, and it was concluded that the relationship between the variables was significant. This indicates that an increase in teacher self-efficacy is linked to an increase in students' academic achievement. On the specific domain, self-efficacy in instructional strategies had a comparatively stronger relationship with academic achievement, r (188) = .24, P < .01 than in classroom management, r (188) = .15, p < .05 Teachers' self-efficacy in student engagement had a weak non-significant relationship with students' academic achievement, r (188) = .11, p > .05.

DISCUSSION OF FINDINGS

The study aimed to investigate the relationship between teacher self-efficacy and academic achievement among grade seven students in Botswana's Kweneng Region. Results revealed a significant but weak positive correlation between these variables. Among the domains of teacher self-efficacy, instructional strategies showed the strongest link to academic achievement, followed by classroom management. Surprisingly, self-efficacy in student engagement had a non-significant weak relationship with achievement.

These findings align with existing literature, which consistently shows a positive link between teachers' self-efficacy and student outcomes. Bal-Taştan et al. (2018) reported similar results in Russian and Iranian samples. Teachers with higher self-efficacy tend to be more enthusiastic, persistent, and committed to student learning (Bandura, 1977). They are more likely to use innovative teaching approaches, provide appropriate feedback, and create supportive learning environments.

Wang (2022) found that teacher self-efficacy led to positive student-level outcomes across various cultural contexts. Efficacious teachers focus on students' basic needs and adopt strategies to nurture these needs, believing in their ability to positively influence student outcomes.

The current study's results are also consistent with research on senior high school students. Dibale et al. (2022) found that teacher support was linked to Nigerian learners' achievement levels. Despite developmental differences in the samples, teachers serve as models, and their behavior can impact students. By modeling self-efficacy, teachers can encourage student engagement and persistence, leading to higher achievement.

These findings support Bandura's social cognitive theory, which posits that modeling and reinforcement influence students' identity, awareness, and educational outcomes (Schunk & DiBenedetto, 2020). A meta-analysis by Yada et al. (2022) further corroborated the positive relationship between teacher self-efficacy and student achievement across various subjects, grade levels, and cultural contexts.

However, it's important to note that some studies have yielded contradictory or mixed results. Jederlund and Von Rosen (2023) found no significant relationship between teacher self-efficacy and student achievement. Similarly, Emiru and Gedefaw (2024) reported inconsistent findings in an Ethiopian sample, where students' engagement was lower than expected despite teachers having higher-than-average self-efficacy.

While the majority of research supports a positive relationship between teacher self-efficacy and student achievement, the strength of this relationship may vary across different contexts and populations. Further research is needed to better understand the factors that moderate this relationship and to develop effective strategies for enhancing teacher self-efficacy and, consequently, student achievement.

LIMITATIONS, IMPLICATIONS AND CONCLUSION.

Limitations and Future Directions

While this study contributes valuable insights to the understanding of teacher self-efficacy and its relationship to academic achievement, several limitations should be acknowledged. The cross-sectional nature of our data limits causal inferences. Further, the study focused on grade seven teachers in Botswana, which potentially limit the generalizability of the findings to other grade levels or geographical contexts. Future research should consider a sample with varied characteristics to enhance internal validity. Third, standardized measures used to measure teacher self-efficacy may be limited considering the multidimensionality of the constructs. Future studies may consider multi-informant and triangulation approaches to further the understanding on the relationship.

Implications and Conclusion

Despite these limitations, our findings have important implications for educational practice and policy. Ministry of Education may consider inculcating self-efficacy training in ongoing teacher professional development programs and have workshops. Further, school administrations should foster a positive work environment that recognizes teachers’ efforts and achievements. This may resultantly help new teachers build self-efficacy.

Furthermore, the non-significant relationship between self-efficacy in student engagement and academic achievement warrants further investigation.

In summary, the findings of this study indicate a weak yet statistically significant positive correlation between

teacher self-efficacy and academic achievement. Although teacher self-efficacy is not the sole determinant of student success, it seems to contribute meaningfully within the multifaceted array of factors affecting academic outcomes.

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