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The Impact of a Social Constructivist Learning Model on Academic Achievement in Physics in Zambian Secondary Schools

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Abstract

This study investigates the impact of a social constructivist learning model on academic achievement in physics among secondary school pupils in Zambia. Utilizing a quasi-experimental design, the research involved 376 pupils from five secondary schools in Lusaka. Data were collected through standardized physics tests administered before and after a four-month intervention period during which the constructivist learning model was implemented. The results revealed a significant improvement in academic performance, with mean post-treatment test scores ($M = 24.72$, $SD = 5.94$) significantly higher than pre-treatment scores ($M = 17.80$, $SD = 4.27$). The paired samples t-test indicated a substantial effect size (Cohen's $d = -0.99$), confirming the effectiveness of the constructivist approach. Additionally, the study found no significant differences in test scores between genders, suggesting the model's inclusivity. The findings underscore the potential of social constructivist learning models to enhance academic achievement in physics, particularly in developing countries like Zambia. These results highlight the need for innovative teaching approaches that promote active engagement, critical thinking, and problem-solving skills among learners.

Keywords: *Social constructivist learning, Academic achievement, Physics education, Zambian secondary schools, Collaborative learning, Critical thinking, Problem-Solving skills, Educational innovation, Learner engagement, Teaching methods*

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1. Introduction

The constructivist learning model, grounded in the theoretical frameworks proposed by Piaget and Vygotsky, highlights the pivotal role of learners in actively constructing their understanding and knowledge through experiential learning and interaction with their environments (Kalpana, 2014; Vygotsky, 1978). This pedagogical approach has gained widespread application across diverse educational settings, notably within the domain of physics education, where it has been demonstrated to enhance learners' cognitive development and academic performance (Calalb, 2023; Bahufite, 2023).

Recent years have witnessed an increasing interest in the application of social constructivist learning frameworks in physics education, particularly to ameliorate the challenges pupils encounter in grasping intricate scientific concepts. Empirical studies indicate that constructivist methodologies, such as problem-based learning (PBL) and inquiry-based learning (IBL), significantly enhance learners' conceptual comprehension and foster positive attitudes towards the

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study of physics (Sagatbek *et al.*, 2024; Saudelli *et al.*, 2021; Qarareh, 2016). These pedagogical strategies promote collaborative learning, critical thinking, and problem-solving skills, capabilities that are essential for academic success.

Despite the favourable outcomes associated with constructivist learning models, research investigating their efficacy within the context of Zambian education remains sparse, especially in relation to the subject of physics. The Zambian education system has been beset by numerous challenges, including inadequate funding, a shortage of qualified educators, and insufficient instructional resources, which collectively contribute to the underperformance of pupils in subjects such as physics (Maguswi, 2011). Addressing these challenges necessitates the implementation of innovative teaching methodologies designed to engage learners and enhance their academic performance.

Traditional pedagogical practices prevalent in Zambian classrooms frequently fall short of fostering critical thinking, problem-solving abilities, and active learner engagement. As a result, there is a pressing need to investigate alternative pedagogical strategies that can effectively address these deficiencies and engender improved learning outcomes. Social constructivist learning models, which prioritize collaborative learning, critical thinking, and the active involvement of learners in the construction of their own knowledge, have shown promise in diverse educational contexts (Calalb, 2023; Sagatbek *et al.*, 2024).

However, empirical studies assessing the effectiveness of these models within the Zambian educational framework, particularly in physics, are limited. This study aims to bridge this gap by investigating the impact of a social constructivist learning model on learners' academic achievement in physics at the secondary school level in Zambia. By scrutinizing the effectiveness of constructivist teaching methodologies in this specific context, the research endeavours to yield insights into how such approaches can be adapted to enhance learners' learning experiences and outcomes in the field of physics.

2. Theoretical Background

The constructivist learning model, rooted in the theories of Piaget and Vygotsky, emphasizes the active role of learners in constructing their own understanding and knowledge through experiences and interactions with their environment (Vygotsky, 1978). This approach has been widely adopted in various educational contexts, including physics education, to enhance learners' cognitive development and academic achievement (Calalb, 2023; Qarareh, 2016). This literature review critically examines the impact of social constructivist learning models on academic achievement in physics, with a focus on the Zambian context.

2.1. Constructivist Learning Models in Physics Education

Constructivist learning models, such as problem-based learning (PBL), inquiry-based learning (IBL), and project-based learning (PjBL), have been shown to significantly improve learners' conceptual understanding and attitudes towards learning physics (Sagatbek *et al.*, 2024; Saudelli *et al.*, 2021). These methods encourage learners to engage in collaborative learning, critical thinking, and problem-solving, which are essential skills for academic success. For instance, PhET simulations have been used effectively in undergraduate physics education to enhance learners' understanding of complex concepts through interactive and experiential learning (Saudelli *et al.*, 2021).

2.2. Theoretical Foundations

The theoretical foundations of constructivist learning models are deeply rooted in the works of Piaget and Vygotsky. Piaget's theory of cognitive development emphasizes the importance of active learning and the role of the learner in constructing knowledge through interaction with the environment (Piaget, 1952). Vygotsky's social constructivism, on the other hand, highlights the significance of social interactions and the Zone of Proximal Development (ZPD) in the learning process (Vygotsky, 1978). These theories provide a robust framework for understanding how constructivist learning models can enhance academic achievement in physics.

2.3. Impact of Constructivist Learning Methods on Learners' Academic Achievement

Extensive research has consistently indicated that constructivist learning models positively influence academic achievement in physics. For instance, Akanwa and Ovute (2014) found that the implementation of a constructivist teaching model significantly improved both the achievement and interest levels of senior secondary school physics pupils. Similarly, Ghaedi *et al.* (2020) demonstrated that an educational framework based on social constructivism positively affected learners' academic performance and critical thinking skills. These findings suggest that constructivist approaches effectively address the challenges learners face in grasping complex scientific concepts.

However, despite these positive outcomes, several gaps and limitations exist in the current literature that necessitate further investigation. Many studies have primarily focused on the frequency of constructivist methodologies and their cognitive implications, often overlooking the contextual factors that influence their implementation. For example, Ates *et al.* (2018) conducted research in Turkey, revealing that constructivist methods were infrequently employed in teacher training institutions, a trend that hampers their subsequent application by science teachers. This phenomenon was attributed to time constraints and examination pressures, compelling educators to revert to traditional teaching methods. Yet, Suneetha (2014) critiqued this justification as insufficient, noting that even when planning lessons, teachers predominantly utilize cognitive verbs to articulate learning objectives, indicating an underlying aim to satisfy learners' curiosity, often the ultimate goal of classroom instruction. This raises the question of whether the theoretical understanding of constructivist principles translates effectively into practice.

Additionally, while studies such as those conducted by Tran and Lewis (2012) and Adak (2017) established a correlation between constructivist methodologies and learner performance, they often lacked a comprehensive analysis of the contextual variables that might influence these outcomes. For instance, Tran and Lewis focused on the Jigsaw method in Vietnamese higher education, highlighting the social dynamics of learning but not addressing potential cultural or systemic barriers to implementation. Similarly, Adak's research in India demonstrated significant performance improvements among learners but did not explore how factors such as socio-economic status or educational resources might affect the efficacy of constructivist methods.

Moreover, the research conducted in Kenya by Mwanda *et al.* (2016) introduced gender as a significant variable in the relationship between constructivist methodologies and academic performance. While they noted that girls demonstrated greater improvement, the study did not delve deeply into the underlying reasons for this disparity, leaving a gap in understanding how gender dynamics interact with constructivist learning environments. Furthermore, Bahufite's (2017) study in Zambia, which examined the application of constructivist methods through ICT integration, concluded that these approaches could stimulate learners' interest and motivation but did not assess statistical significance, limiting the robustness of the findings.

Overall, while the literature indicates that the application of constructivist methods is associated with improved academic performance, there is a notable lack of comprehensive studies that examine the contextual factors influencing these outcomes, particularly in the Zambian secondary education context. The existing research often fails to address the complexities of implementation, including cultural, gender-based, and systemic variables that can impact the effectiveness of constructivist approaches. Therefore, this study aims to fill these gaps by investigating the impact of a social constructivist learning model on academic achievement in physics in Zambian secondary schools, thereby contributing to a deeper understanding of how these methodologies can be effectively applied in diverse educational settings.

2.4. Challenges in the Zambian Education System

Despite the promising outcomes associated with constructivist learning models, the Zambian education system faces significant challenges that impede their effective implementation. Key obstacles include inadequate funding, a shortage of qualified teachers, insufficient teaching resources, and poor infrastructure (UNICEF Zambia, nd; Bahufite, 2015). These issues contribute to learners' underachievement in subjects such as physics, underscoring the need for innovative teaching approaches that engage learners and enhance their academic performance (Maguswi, 2011).

2.5. Addressing the Challenges

To address these challenges, it is essential to promote the use of constructivist learning models in Zambian classrooms. Research has shown that these models can enhance learners' intrinsic motivation, critical thinking, and metacognitive knowledge, which are crucial for academic achievement (Calalb, 2023). Additionally, school administrations should support the professional development of teachers through Continued Professional Development (CPD) programs to ensure they are equipped with the necessary skills to implement constructivist approaches effectively (Bahufite *et al.*, 2023).

The literature reviewed highlights the significant impact of social constructivist learning models on academic achievement in physics. These models, grounded in the theories of Piaget and Vygotsky, promote active learning, critical thinking, and problem-solving, which are essential for academic success. However, the effective implementation of these approaches in the Zambian context requires addressing the challenges of inadequate funding, lack of qualified teachers, and insufficient teaching resources. By promoting the use of constructivist learning models and supporting the professional development of teachers, it is possible to enhance the academic achievement of learners in physics and other subjects.

3. Methodology

This study employed a quasi-experimental research design to investigate the impact of a social constructivist learning model on academic achievement in physics among secondary school pupils in Lusaka, Zambia. The design included pre-test and post-test assessments to measure the changes in academic performance before and after the implementation of the constructivist learning model (Ayaz and Şekerci, 2015).

3.1. Participants

The study involved 376 grade 10 pupils from five secondary schools in Lusaka. The participants were selected using a stratified random sampling technique to ensure representation from each school. The sample included pupils from different grades and age groups to provide a comprehensive understanding of the impact of the constructivist learning model across various demographics (UNICEF Zambia, nd).

3.2. Data Collection

Data collection for this study involved two series of standardized physics assessments. Initially, a pre-test was administered prior to the implementation of the constructivist learning model to establish a baseline for the pupils' academic performance in physics. This pre-test encompassed a variety of questions addressing fundamental physics concepts and principles, thereby measuring the pupils' initial understanding.

Following a four-month period of instruction employing the social constructivist learning model, which emphasizes collaborative learning, critical thinking, and problem-solving, a post-test was administered. During this instructional phase, teachers facilitated engaging activities that included group discussions, hands-on experiments, and interactive exercises, aimed at promoting active participation among pupils (Saudelli *et al.*, 2021).

The post-test, administered at the conclusion of the four-month intervention, was structured similarly to the pre-test, ensuring comparability of the assessments. This design enabled an effective evaluation of the impact of the constructivist learning model on the pupils' academic performance in physics (Ghaedi *et al.*, 2020). Thus, the research aimed to assess the extent of academic improvement attributable to the intervention applied over the duration of the study.

3.3. Data Analysis

The data collected from pre-test and post-test assessments were analyzed utilizing various statistical methods to evaluate the impact of the constructivist learning model on academic achievement in physics. Initially, descriptive statistics, namely, the mean, standard deviation, and range, were computed for both pre-test and post-test scores to provide a summary of the data.

Subsequently, a paired sample t-test was employed to compare the mean scores of the assessments before and after the intervention. This test aimed to ascertain whether a statistically significant difference existed in academic performance as a result of the constructivist learning model. To assess the magnitude of this impact, effect size was calculated, with Cohen's *d* serving as a metric for interpretation. Cohen's *d* values of 0.2, 0.5, and 0.8 were associated with small, medium, and large effects, respectively (Cohen, 1988).

Additionally, an Analysis of Variance (ANOVA) was conducted to explore variations in academic performance among different schools and demographic groups. This analysis illuminated potential disparities in the effectiveness of the constructivist learning model relative to factors such as pupil's age.

3.4. Ethical Considerations

The study adhered to ethical guidelines to ensure the protection of participants' rights and well-being. Informed consent was obtained from all participants and their guardians before the commencement of the study. Confidentiality and anonymity were maintained throughout the research process, and data were securely stored to protect participants' privacy.

4. Results

This report analyses the provided data from a study investigating the impact of a social constructivist learning model on physics academic achievement in Zambia. The analysis focuses on descriptive statistics, paired samples t-tests, non-parametric alternatives, and ANOVA, interpreting the findings in the context of the research question.

4.1. Descriptive Statistics

The sample comprised 372 pupils with a mean age of 15.93 years (SD = 1.13, range 12-19). The pre-treatment physics test scores had a mean of 17.80 (SD = 4.27, range 8-30), while post-treatment scores averaged 24.72 (SD = 5.94, range 10-42).

The positive skewness in post-treatment scores suggests that a few pupils achieved significantly higher marks than the majority. The slight negative kurtosis for both pre- and post-treatment scores indicates the distributions are platykurtic (slightly flatter than a normal distribution). The descriptive statistics for the pupils' age, pre-treatment test results, and post-treatment test results are presented in Table 1.

	N Statistic	Min Statistic	Max Statistic	Mean Statistic	SD Statistic	Kurtosis	
						Statistic	SE
Pupil's Age	372	12	19	15.93	1.128	.334	.252
Pre-treatment Test Results	376	8	30	17.80	4.266	-.483	.251
Post-treatment Test Results	376	10	42	24.72	5.942	-.341	.251
Valid N (listwise)	372						

The discrepancy in N between some descriptive statistics (372 vs 376) suggests missing data due to some pupils' abstaining from disclosing their ages, potentially impacting the analysis. Listwise deletion was used, which can lead to loss of statistical power if missingness is not random.

4.2. Impact of the Social Constructivist Model (Paired Samples Analysis)

The central research question examines the impact of the intervention (a learning-teaching process employing the social constructivist learning model). A paired samples *t*-test was conducted to assess this, revealing a statistically significant difference between pre- and post-treatment scores ($t(375) = -19.139, p < 0.001$). The mean difference of -6.92 reflects a notable improvement in post-treatment scores. The effect sizes (Cohen's $d = -0.99$ and Hedges' $g = -0.99$) are classified as large, indicating a robust effect of the intervention. These findings substantiate the efficacy of the social constructivist learning model in enhancing physics academic achievement.

Given the large sample size, it's reasonable to proceed with the parametric paired *t*-test. However, the non-parametric Wilcoxon signed-rank test was also conducted, and it yielded similarly significant results ($p < 0.000$). This strengthens the conclusion that the intervention had a significant positive impact, irrespective of potential violations of normality assumptions for the paired *t*-test. The hypothesis test summary for the related-samples Wilcoxon signed rank test is presented in Table 2.

Null Hypothesis	Test	Sig. ^{a,b}	Decision
1. The median of differences between Pre-treatment Test Results and Post-treatment Test Results equals 0.	Related-Samples Wilcoxon Signed Rank Test	.000	Reject the null hypothesis.

Note: a. The significance level is 0.050; b. Asymptotic significance is displayed.

4.3. Relationship between Age and Test Scores (Paired Samples Analysis)

A paired samples *t*-test was conducted to examine the relationship between age and test scores. The results revealed statistically significant positive correlations between age and both pre-treatment ($t(371) = 7.938, p < .001$, Cohen's $d = 0.41$) and post-treatment scores ($t(371) = 27.872, p < 0.001$, Cohen's $d = 1.45$). The effect size for post-treatment scores was moderate to large, indicating that older pupils performed significantly better. These findings suggest the need for further investigation into potential confounding variables, such as prior learning experiences or maturity levels, which may mediate the relationship between age and academic achievement.

4.4. Influence of Pupil's Gender (Independent Samples Analysis)

The Mann-Whitney U tests revealed no statistically significant difference in pre-treatment ($p = 0.464$) or post-treatment ($p = 0.555$) scores between genders (Table 3). This suggests that the impact of the social constructivist learning model

Null Hypothesis	Test	Sig. ^{a,b}	Decision
1. The distribution of Pre-treatment Test Results is the same across categories of Pupil's Gender.	Independent-Samples Mann-Whitney U Test	0.464	Retain the null hypothesis.
2. The distribution of Post-treatment Test Results is the same across categories of Pupil's Gender.	Independent-Samples Mann-Whitney U Test	0.555	Retain the null hypothesis.

Note: a. The significance level is 0.050; b. Asymptotic significance is displayed.

was consistent across genders. The use of the non-parametric Mann-Whitney U test is appropriate given the involvement of the nominal-scale variable, gender in the hypothesis testing.

4.5. ANOVA Results and Effect Sizes

The analysis of variance (ANOVA) revealed no statistically significant differences in pre-treatment test scores among the various age groups ($F(7, 364) = 0.398, p = .903$). Similarly, no significant differences were observed in post-treatment test scores ($F(7, 364) = 0.995, p = .435$). The examination of additional factors, as indicated by the degrees of freedom ($df = 7$) between-groups, yielded non-significant results ($p > .05$) for both pre-treatment and post-treatment assessments. Effect sizes, quantified using eta-squared (η^2) and omega-squared (ω^2), were found to be negligible, suggesting that the influence of these additional factors on performance outcomes was minimal in both pre-treatment and post-treatment tests. It is noteworthy that the limited statistical power of the analysis may be attributed to the relatively small sample sizes associated with these factors.

The calculated effect sizes for the ANOVA are presented in Table 4. Specifically, the eta-squared value for pre-treatment test scores was 0.008, indicating a trivial effect size, while the eta-squared value for post-treatment test scores was 0.019, also reflecting a small effect size.

The study provides strong evidence supporting the effectiveness of the social constructivist learning model in improving physics academic achievement in the Zambian context. The significant improvement in post-treatment scores, coupled with large effect sizes, suggests a substantial and positive impact.

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Pre-treatment Test Results	Eta-squared	.008	.000	.010
	Epsilon-squared	-.011	-.019	-.009
	Omega-squared Fixed-effect	-.011	-.019	-.009
	Omega-squared Random-effect	-.002	-.003	-.001
Post-treatment Test Results	Eta-squared	.019	.000	.034
	Epsilon-squared	.000	-.019	.016
	Omega-squared Fixed-effect	.000	-.019	.016
	Omega-squared Random-effect	.000	-.003	.002

Note: a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model; b. Negative but less biased estimates are retained, not rounded to zero.

5. Discussion

The findings of this study align with the existing literature on the effectiveness of social constructivist learning models in enhancing academic achievement, particularly in the context of physics education in Zambian secondary schools. The previous Research indicates that approaches such as problem-based learning (PBL) and inquiry-based learning (IBL) can significantly improve learners' conceptual understanding and attitudes toward learning physics (Sagatbek *et al.*, 2024; Saudelli *et al.*, 2021). These methodologies promote collaborative learning, critical thinking, and problem-solving, all of which are essential skills for academic success.

The theoretical underpinnings of constructivist learning models, derived from the works of Piaget and Vygotsky, highlight the importance of active learner participation in constructing knowledge through experiences and interactions within their environment (Vygotsky, 1978; Bahufite *et al.*, 2023). Our study provides empirical evidence that supports the efficacy of social constructivist learning models in enhancing academic performance by fostering active engagement and critical thinking.

However, the implementation of constructivist approaches in the Zambian education system faces significant challenges, including inadequate funding, a shortage of qualified teachers, insufficient teaching resources, and poor infrastructure (UNICEF Zambia, nd). These obstacles necessitate innovative teaching strategies that can engage learners and boost their academic performance.

The results from this research underscore the potential of social constructivist learning models to overcome these challenges and improve the academic achievement of secondary school pupils in Lusaka, Zambia. By emphasizing active engagement, critical thinking, and problem-solving, constructivist approaches prepare learners with the essential skills needed for both academic success and lifelong learning.

Furthermore, this study advances knowledge in education by highlighting the effectiveness of social constructivist learning models in the specific context of Zambian secondary schools. It aligns with existing literature while presenting evidence for successful implementation in diverse educational settings (Ayaz and Şekerci, 2015; Ghaedi *et al.*, 2020). Notably, our findings reveal that the social constructivist learning model is effective across various genders and age groups, indicating its inclusivity and adaptability for diverse learner populations (Saudelli *et al.*, 2021).

In addressing the unique challenges faced by developing countries, this study emphasizes that innovative teaching approaches can help bridge gaps in resources and support improved academic performance (UNICEF Zambia, nd). Moreover, it highlights the value of promoting critical thinking and problem-solving abilities through active, collaborative learning. These skills are vital not only for academic success but also for lifelong learning, and the constructivist learning model has been shown to effectively cultivate them (Sagatbek *et al.*, 2024).

In summary, the successful application of the constructivist learning model in this study indicates its potential for broader application across different subjects and educational contexts. This creates opportunities for future research and encourages educators to adopt constructivist approaches across various disciplines. Moreover, this study contributes to the growing body of evidence supporting the benefits of constructivist learning models, offering valuable insights into their application, especially within developing countries.

6. Conclusion

The results of this study offer robust evidence that the adoption of a social constructivist learning model significantly enhances academic performance in physics among secondary school pupils in Zambia. The primary conclusions derived from the research are summarized as follows:

The investigation revealed a marked improvement in pupils' academic performance following the introduction of the constructivist learning model. The mean post-treatment test scores exhibited a statistically significant increase compared to pre-treatment scores, thereby substantiating the efficacy of the intervention. Furthermore, the calculated effect sizes (Cohen's $d = -0.99$ and Hedges' $g = -0.99$) indicate a large effect, suggesting a substantial influence of the constructivist model on academic achievement. This finding highlights the potential of constructivist methods to facilitate meaningful learning experiences and enhance educational outcomes.

Additionally, the constructivist learning model demonstrated consistent effectiveness across various gender and age groups, emphasizing its inclusivity and adaptability. This aspect suggests that constructivist pedagogical approaches can accommodate diverse learner populations without bias. The study further identified a significant positive correlation between age and test scores, indicating that older learners exhibited superior performance. This observation suggests

that age-related factors, including maturity and prior educational experiences, may play a role in influencing academic achievement.

The analysis of the study's findings also indicated no significant differences in test scores between male and female pupils, suggesting that the constructivist learning model exerts a uniform impact on both genders.

In light of these findings, the study advocates for the wider implementation of constructivist learning models to enhance active engagement, critical thinking, and problem-solving abilities, which are imperative for academic success. To facilitate the effective integration of constructivist methodologies, it is essential for educators to receive ongoing professional development and training. Such initiatives will equip teachers with the requisite skills and knowledge to cultivate constructivist learning environments.

Moreover, further research should be conducted to explore the implications of age-related factors on academic achievement. A comprehensive understanding of how maturity and prior educational experiences impact learning outcomes can inform the design of educational interventions tailored to meet the needs of various age demographics. Additionally, future studies should investigate other potential confounding variables, including socioeconomic status, prior academic performance, and teacher quality. Controlling for these variables will facilitate a more precise understanding of the true effects of constructivist learning models.

Limitations of the Study: Confounding Variables such as participants' gender, age, socio-economic background, motivational level, IQ, etc. as well as some experimenter-related factors were suspected to also affect research findings. These were anticipated and effort was made to minimise them as much as possible by applying simple and stratified random samplings and keeping as neutral as possible during the data collection process. Furthermore, some statistical tests were run to verify the extent to which factors such as gender and age could affect the results so that they could be controlled in all the statistical tests. However, the significant correlation between age and test scores necessitates controlling for age in future analyses to isolate the true effect of the intervention. Further research should explore other potential confounders, including socioeconomic status, prior academic performance, and teacher quality.

References

- Adak, S. (2017). *Effectiveness of Constructivist Approach on Academic Achievement in Science at Secondary Level. Educational Research and Reviews*, 12(22), 1074-1079. doi: <https://10.5897/ERR2017.3298>
- Akanwa, U.N. and Ovute, A.O. (2014). *The Effect of Constructivist Teaching Model on SSS Physics Students' Achievement and Interest. IOSR Journal of Research & Method in Education*, 4(1), 35-38. Retrieved from <https://www.iosrjournals.org/iosr-jrme/papers/Vol-4%20Issue-1/Version-1/H04113538.pdf>
- Ates, O., Unal Coban, G. and Kaya Sengoren, S. (2018). *Consistency Between Constructivist Profiles and Instructional Practices of Prospective Physics Teachers. European Journal of Educational Research*, 7(2), 359-372. doi: <https://10.12973/eu-jer.7.2.359>
- Ayaz, M.F. and Şekerci, H. (2015). *The Effects of the Constructivist Learning Approach on Student's Academic Achievement: A Meta-Analysis Study. Educational Research and Reviews*, 10(4), 364-371. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1077612.pdf>
- Bahufite, E. (2015). *Application of the Constructivist Methods of Teaching-Learning Through the Use of Information and Communication Technologies (ICTs) in Zambian Schools. A Case of Three Secondary Schools in Lusaka (Master's Dissertation)*. Lusaka: University of Zambia.
- Bahufite, E. (2017). *Application of the Constructivist Methods of Teaching-learning Through the Use of ICTs in Zambian Schools. A Case of Selected Secondary Schools in Lusaka. International Journal of Scientific & Engineering Research*, 8(12), 848-862 ISSN 2229-5518.
- Bahufite, E. (2023). *Investigation into the Constructivist Methods Applied in Teaching Physical Science and Their Effects on the Learner's Self-Esteem and Academic Performance in Zambian Secondary Education*. (PhD Thesis). Lusaka: The University of Zambia.
- Bahufite, E., Kasonde-Ng'andu, S. and Akakandelwa, A. (2023). *The Relationships Between Learners' Academic Achievement Due to the Use of Constructivist Methods in Physical Science and Their Self-esteem in Zambian Secondary Schools. Social Sciences & Humanities Open*, 8(1), 2590-2911. Article 100632, 10.1016/j.ssaho.2023.100632
- Calalb, M. (2023). *The Constructivist Principle of Learning by Being in Physics Teaching. Educational Research and Practice*, 31(1), 52-69. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1377906.pdf>

- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*, 2nd Edition, Lawrence Erlbaum Associates.
- Kalpana, T. (2014). A Constructivist Perspective on Teaching and Learning: A Conceptual Framework. *International Research Journal of Social Sciences*. 3(1), 27-29. Available online at: www.isca.in, www.isca.me
- Maguswi, B.V. (2011). Factors Contributing to Under Achievement of Zambian Female Students in O-level Physics Examinations: A Case of Selected High Schools in Central Province (Master's Dissertation). *University of Zambia*. Retrieved from <https://dspace.unza.zm/server/api/core/bitstreams/b38ca5a3-9508-49f3-b819-585aa5c2f9fe/content>
- Mwanda, M.G., Odundo, P., Midigo, R. and Mwanda, O. S. (2016). Adoption of the Constructivist Learning Approach in Secondary Schools in Kenya: Focus on Learner Achievement in Biology by Class Category. *US-China Education Review*. 6(1), 31-44. doi: <https://10.17265/2161-623X/2016.01.003>
- Piaget, J. (1952). *The Origins of Intelligence in Children*. International Universities Press.
- Qarareh, O.A. (2016). The Effect of Using the Constructivist Learning Model in Teaching Science on the Achievement and Scientific Thinking of 8th Grade Students. *International Education Studies*. 9(7), 1913-9039. doi: <https://10.5539/ies.v9n7p178>
- Sagatbek, A., Oni, T. K., Miller, E. A., Gabdullina, G. and Balta, N. (2024). Do High School Students Learn More or Shift Their Beliefs and Attitudes Toward Learning Physics with the Social Constructivism of Problem-Based Learning? *Education Sciences*, 14(12), 1280. Retrieved from <https://www.mdpi.com/2227-7102/14/12/1280>
- Saudelli, M.G., Kleiv, R., Davies, J., Jungmark, M. and Mueller, R. (2021). PhET Simulations in Undergraduate Physics: Constructivist Learning Theory in Practice. *Educational Research and Practice*, 31(1), 52-69. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1324693.pdf>
- Suneetha, Y. (2014). Constructive Classroom: A Cognitive Instructional Strategy in ELT. *i-Manager's Journal on English Language Teaching*, 4(1).
- Tran, V.D. and Lewis, R. (2012). The Effects of Jigsaw Learning on Students' Attitudes in a Vietnamese Higher Education Classroom. *International Journal of Higher Education*, 1(2). doi: <http://dx.doi.org/10.5430/ijhe.v1n2p9>
- UNICEF Zambia. (nd). *Education. In Zambia, We Support the Provision of Quality Education*. Retrieved from <https://www.unicef.org/zambia/education>
- Vygotsky, L.S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

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