



Mediating Role of Instructional and Assessment Strategies on Learners' Engagement in Educational Statistics

Arsene Tchocgnia Yanya¹

¹ University of Yaounde 1, Cameroon

*Corresponding Author: Arsene Yanya. Tchocgnia

E-mail:

Article Info

Article History:

Received: 16 July 2024

Revised: 13 August 2024

Accepted: 21 September 2024

Keywords:

Statistics

Instruction

Engagement

Abstract

Cameroon, like many nations worldwide, is striving to achieve quality basic education and reduce the rate of school dropouts. In this process, teacher-trainers carry an immense responsibility of transmitting relevant and motivational skills to student teachers, ensuring that when they enter the field, they remain mindful of their role in shaping the nation builders of tomorrow. However, one cannot effectively train nation builders without first being a competent educator and critical thinker. This study was designed to examine the extent to which student teachers are responsive to instructional and assessment strategies that promote critical thinking and decision-making skills during field practice for the benefit of future generations. A total sample of 265 student teachers was selected from both a government and a private teacher training institution. Data were collected through questionnaires administered using simple random sampling, yielding a 74.8% response rate. The instrument contained 35 items addressing dependent and independent variables. Data analysis was conducted at the 0.05 significance level using correlation and regression with IBM SPSS version 21. The findings revealed that direct instruction, interactivity, quizzes, and portfolio assessments all correlated positively with student engagement. Quiz-mediated and portfolio-mediated interactivity emerged as the most effective strategies, suggesting that combining these methods offers the greatest potential for enhancing student engagement in educational statistics.

INTRODUCTION

In the culture of teacher education institutions, the involvement of pre-qualified educators with courses dedicated to educational statistics is a key element of their pedagogical teaching and their coming career success (Fredricks et al., 2004; Iqbal and Ali, 2024; Leslie, 2020; Harris and Sass, 2011; Zhao et al., 2024). The understanding of the mediating determinants that condition this involvement is essential to maximizing the efficacy of teacher-education programs. The current research includes the synthesis of the empirical data on the indirect impact of instructional and assessment methods, i.e., quizzes, portfolios, direct instruction, and interactive methods, on the interest of student teachers in educational statistics in Teacher Training Colleges located in Mfoundi Division of Yaounde, Cameroon.

The interaction between students and teachers is described as active, maintained, and evidently committed throughout the learning process (Skinner and Belmont, 1993; Cinches et al., 2017; Bergmark and Westman, 2018; Human-Vogel and Dippenaar, 2013). Being a multifactorial construct, it is a cognitive, behavioural as well as affective construct. Such engagement is significantly influenced by the implementation of specific teaching and assessment plans in statistics courses. Quizzes are equally used as formative assessment and give instant feedback (Black and Wiliam, 1998). Portfolios promote self-reflection and self-assessment (Barrett, 2005). Direct instruction provides an orderly presentation of content (Rosenshine, 2012). Interactive approaches lead to the development of collaborative learning and active knowledge building (Bonk & Zhang, 2008).

In Teacher Training Colleges, Yaounde in the Mfoundi Division of Cameroon, there are unique pedagogical issues and opportunities posed. To impact educational statistics, it is crucial to comprehend how the above instructional and assessment modalities affect student-teacher interactions to shape the curricular reformation in this context (Obena, 2021; Mekolle, 2024; Adedeji & Olaniyan, 2011). The existing article combines the available Cameroonian and global literature to provide an in-depth analysis of the moderating role of instruction and assessment plans on student-teacher engagement in educational statistics. Through the elucidation of different viewpoints of local and international scholars, the work hopes to produce practical ideas that could influence policy choices and practice in teacher-training institutions in Cameroon (Schwille et al., 2007; Kuchah, 2013).

When conducting a methodical inquiry into the mediating role of these strategies, we must mention the significant amount of research which has developed our knowledge of the field. New studies by Smith et al. (2019) highlight the significance of interactive pedagogies in enhancing student engagement in statistics teaching, and Zubizarreta (2009) highlights the importance of portfolios in fostering reflective skills in student teachers. This paper, therefore, will seek to shed light on the complex connection between instruction and assessment methods and student teacher interaction in the field of teaching statistics in a narrower setting, the Teacher Training Colleges in the Mfoundi Division, Yaounde, Cameroon. The study through its mediating effects analysis of quizzes, portfolios, direct instruction and interactivity aims at providing substantive recommendations that would promote the quality of teacher-education programmes and ultimately lead to the professional growth of future educators in Cameroon.

Although the student-teacher interaction in teaching statistics is recognized to be crucial in enhancing professional knowledge, there is a conceptual gap as to the moderating role that instructional and assessment instruments like quizzes, portfolios, direct instruction, and interactivity play in teacher training colleges in the Mfoundi Division, Yaounde, Cameroon. The effects of these strategies on student-teacher engagement in the Cameroonian setting are still understudied through empirical research. In this respect, there has been a strong need to study the mediating influence of such pedagogical interventions in order to improve the teaching education programs in the area.

In this dissertation, we examine the mediating effect of instructional and assessment strategies on student-teacher interaction in educational statistics among colleges of teacher training in the Mfoundi Division, Yaounde, Cameroon. The independent variables are quiz, portfolio, direct instruction and interactivity, and the dependent variable is studentteacher engagement. Based on Cameroonian and international academic literature written in APA 7, the empirical review aims at explaining the impact of such instructional and evaluation strategies on the student-teacher engagement in the field of educational statistics.

The involvement of students is a critical factor that surrounds success in the learning process especially in the educational statistics field. The current research concentrates on how the instructional and assessment techniques mediate student-teacher interaction in teacher training colleges in Mfoundi Division, Yaounde, Cameroon. The study will provide information on the productive pedagogical strategies in the area by examining consequences of quizzes, portfolios, direct instruction, and interactivity on student-teacher engagement. In the educational statistics, student engagement and learning outcomes have been shown to improve with the use of interactive teaching methods (Kamran et al., 2023). Kulasegaram and Rangachari (2018) highlighted the importance of formative assessment materials like quizzes in teaching students and engaging them. Portfolio usage was discovered to facilitate reflective learning and enhance student attention to statistical concepts in Chen et al. (2019).

This empirical study is a mixed-method study, which is a combination of quantitative surveys and qualitative interviews with student teachers of teacher training colleges in the Mfoundi Division. To ensure a heterogeneous outlook of the mediating effects of the instructional and assessment strategies on the student and teacher engagement, the sample will include both the foreign and Cameroonian students. The initial evidence shows that quizzes, portfolios, direct instruction, and interactivity have a strong impact on student-teacher engagement shaping in the educational statistics. Cameroon students reveal their preference of practical and cooperative learning processes, and the foreign students emphasize the need of the clarity of their explanations and demonstrations to improve their levels of engagement. By combined views of both Cameroonian and foreign students the research sheds light on mediating influence of instructional and testing strategies on student-teacher interaction in educational statistics. The results have consequences on curriculum development and pedagogical application in teacher training colleges of the Mfoundi Division, Yaounde, Cameroon.

METHODS

The present research adopted a correlational survey design and employed regression analysis as the main statistical tool to examine the relationships among the study variables. The study was conducted in Cameroon, specifically within the Mfoundi Division, which is home to several teacher training institutions that serve as the training ground for future educators. The target population for this research consisted of all student teachers enrolled in teacher training colleges within the Mfoundi Division. This population was considered appropriate because student teachers represent the immediate beneficiaries of teacher education programs and thus provide valuable insights into the dynamics of training and professional preparation. In order to determine an appropriate sample size, the study followed the guidelines established by Research Advisors (2006), which provided a methodological framework for calculating representative samples based on population size and confidence levels.

From this procedure, a sample of 265 student teachers was drawn for participation in the study. The sampling strategy involved both purposive and probabilistic approaches to ensure representativeness and feasibility. At the first stage, judgmental sampling was applied to select two institutions to be included in the research: one government-owned teacher training college and one privately-owned counterpart. This choice allowed for a comparative dimension between public and private institutions, thereby capturing a more nuanced picture of the training context in Mfoundi Division. Once the institutions were identified, the second stage of sampling employed a simple random sampling technique to select individual student teachers from the available classes in each college. This ensured that every student

within the selected colleges had an equal chance of being included in the study, thereby reducing selection bias and enhancing the credibility of the findings.

For data collection, the study relied on a structured questionnaire, which was designed to capture relevant information from student teachers regarding their experiences, perceptions, and attitudes. The questionnaire consisted of both closed and open-ended items, enabling the collection of quantifiable data while also allowing space for participants to elaborate on their responses where necessary. The structured nature of the instrument facilitated uniformity in responses, while its design was guided by the study's conceptual framework to ensure that all items were directly aligned with the research objectives. The questionnaires were administered during class sessions with the assistance of designated research facilitators, who explained the purpose of the study and assured participants of confidentiality and voluntary participation. This approach not only enhanced the response rate but also helped to clarify any ambiguities in the questionnaire items.

The table below provides a detailed description of the target population as well as the accessible population that was ultimately sampled for the research. This description outlines the distribution of student teachers across the selected institutions and illustrates the representativeness of the sample. By combining purposive institutional selection with random student sampling, the methodology ensured both contextual relevance and statistical rigor, thereby strengthening the validity of the study's results.

Table 1. Target and accessible population

School	Questionnaires Issued	Questionnaires Returned	% Of Response
Bttc Melen	68	68	25.7
Gbtcc Nlongkak	197	130	49.1
Total	265	198	74.8

The data collection instrument used was a questionnaire that was issued to the student teachers. There were three parts in the questionnaire, which included: an introduction element, a section where all the items would relate to the modalities of the independent and dependent variables, and a closing paragraph where the researcher would appreciate the respondents. The Likert scale ranging between Strongly Agree (SA) and Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD) was used. The reliability of the instrument was measured as the extent to which it gave consistent, steady and reliable measurements of the constructs desired. Twenty students attending VIVA Bilingual Teacher Training College were used as participants in this study to fill the questionnaire. The answers were coded and then they were analyzed through correlation. The alpha coefficient of Cronbach was 0.80 which represented good internal consistency.

To ease the process of collecting data, the researcher obtained a research permit in the first place, signed by the dean of the Faculty of Education. This authorization allowed one to access the different teacher training institutions in Mfoundi Division. Based on this, the researcher was able to secure cooperation of the administrative authorities, teaching staff and also the student teachers, who helped in the administration and collection of the questionnaire. The analysis of the data was made using 21 version of IBM SPSS. The statistical analyses were conducted in order to provide answers to all research questions. The hypothesis was tested using bivariate linear regression, which, in its turn, was used to answer the research questions.

RESULTS AND DISCUSSION

This study was conducted within teacher training colleges in the Mfoundi Division of Yaoundé, Cameroon, where the teaching of educational statistics remains a critical

component of professional preparation for future educators. Despite its importance, statistics is often perceived as abstract and challenging, which affects student teachers' engagement and learning outcomes. In this context, instructional and assessment strategies such as direct instruction, quizzes, portfolios, and interactivity were examined for their potential to enhance student teacher engagement. Engagement here is understood as a multidimensional construct encompassing cognitive, behavioral, and emotional involvement in the learning process. By investigating the mediating effects of these strategies, this study aims to provide empirical insights into how teaching approaches can be better aligned with the needs of student teachers in Cameroon. Such insights are particularly important given the national goal of improving teacher education programs to ensure that future educators are equipped with both statistical literacy and pedagogical competence.

Table 1. Regression Analysis of Instructional and Assessment Strategies on Student Engagement

Variable	R ²	Adjusted R ²	Df	F-Stat	Significance
Direct Instruction	.214	.210	1	53.330	.000
Direct Instruction - Quiz	.325	.318	2	47.013	.000
Direct Instruction - Portfolio	.316	.309	2	45.141	.000
Portfolio	.248	.244	1	64.548	.000
Interactivity	.297	.293	1	82.820	.000
Interactivity- Quiz	.372	.365	2	57.673	.000
Interactivity - Portfolio	.371	.365	2	57.578	.000

The results of the regression analysis reveal important insights into the contribution of instructional and assessment strategies to student engagement. Direct Instruction alone accounts for 21.4% of the variance in student engagement ($R^2 = .214$, Adjusted $R^2 = .210$). Although this indicates a moderate effect, the high F-statistic (53.330, $p < .001$) confirms that the model is statistically significant. This finding suggests that teacher-led, structured delivery provides a foundational but not exhaustive explanation of engagement levels, highlighting the need for complementary strategies to capture the remaining unexplained variance.

When Direct Instruction is combined with quizzes, the explanatory power increases to 32.5% ($R^2 = .325$, Adjusted $R^2 = .318$; $F = 47.013$, $p < .001$). A similar improvement is observed when Direct Instruction is paired with portfolios, which together explain 31.6% of the variance ($R^2 = .316$, Adjusted $R^2 = .309$; $F = 45.141$, $p < .001$). These results indicate that assessment strategies significantly mediate the effectiveness of Direct Instruction, transforming what might otherwise be a largely passive mode of delivery into a more interactive and reflective learning process. The statistical improvement underscores the importance of integrating formative tools such as quizzes and portfolios into teacher-centered approaches.

Portfolios independently explain 24.8% of the variance in engagement ($R^2 = .248$, Adjusted $R^2 = .244$; $F = 64.548$, $p < .001$), reflecting their role as effective standalone tools for fostering reflection and self-regulated learning. Interactivity, however, proves to be a stronger single predictor, accounting for 29.7% of the variance ($R^2 = .297$, Adjusted $R^2 = .293$; $F = 82.820$, $p < .001$). This suggests that environments that promote active participation and collaboration yield greater engagement than structured delivery alone.

The most robust effects emerge from models where interactivity is combined with assessment strategies. The interaction between Interactivity and Quizzes explains 37.2% of the variance ($R^2 = .372$, Adjusted $R^2 = .365$; $F = 57.673$, $p < .001$), while the

interaction between Interactivity and Portfolios accounts for 37.1% ($R^2 = .371$, Adjusted $R^2 = .365$; $F = 57.578$, $p < .001$). These high values indicate that interactive learning environments, when paired with ongoing assessment, create the most conducive conditions for sustained engagement.

The adjusted R^2 values, taken as a whole, indicate that Direct Instruction, Quizzes, Portfolios, and Interactivity can account a significant percentage of the variance in the student engagement both separately and collectively. The results not only point out the importance of each individual strategy but also how critical combining them can be. The crucial implication of this is that overemphasis on one approach to statistics especially Direct Instruction could be inadequate in the context of statistical education. Rather, an integration of instructive delivery with interactivity and formative assessment seems to provide the best engagement level results.

Integrating Instructional and Assessment Strategies for Student Engagement

This research has revealed that there are significant effects of instructional and assessment strategies on the engagement of student teachers in educational statistics, but their differences and nature are not the same. Direct Instruction did explain a large amount of variance in engagement but was no better than the interactive or assessment mediated approaches. This supports the argument that while structured delivery can have a role to play in providing the foundation for the development of knowledge, this must be supplemented by a range of techniques that support active learning. This balance has been highlighted in other research: beyond provision of the scaffold on the higher-order concepts, explicit careful instructions provide the opportunity to discuss and see exactly what is meant (Rosenshine, 2012); and without opportunities for interaction, direct instruction does have potential for passive learning (Hattie, 2009). This can then disadvantage students in the Cameroonian context where statistics is often viewed as something abstract and even threatening (Nkwenti & Fokum, 2018), and methods of direct teaching can often be over-used.

Quizzes, when added on to either Direct Instruction or Interactivity, were a very effective behaviorally engaging tool. This coincides with the recommendations of Black and Wiliam (1998) and of Kulasegaram & Rangachari (2018), that formative assessment can be used to boost motivation and enhance knowledge retention. Consistent with other studies, Nadeem et al. (2023) and Smith et al. (2015), our results show that low stakes testing, when applied repeatedly, increases retention of what is being tested and reduces stress in higher-order studies. In this trash, quizzes seem to alter the learning environment by promoting the active recall and accountability. This suggests that the use of quizzes as part of the teachers' training must be further consolidated in order to improve learning in statistics courses even more.

Likewise, portfolios showed impressive explanatory power on their own and in tandem with instructional approaches. This finding indicates that portfolios are reflective and developmental (Barrett, 2005; O'Sullivan and Taylor, 2018; Rostami and Talebinejad, 2018). Portfolios provide opportunities for learners to track progress, communicate individual learning goals and have them critically examined. They also help develop professional identity and readiness to practice in the case of teacher preparation (Williams & Chinn, 2017; Zhang, 2021; Meihami & Esfandiari, 2021). Portfolios encourage reflection, but they require institutional support and assessment systems to be most useful and not used more or less haphazardly. This finding is of concern regarding the practice of a type of systematic portfolio construction in Cameroonian teacher training programmes.

Interactivity produced the best engagement results, particularly when combined with other assessment measures (including quizzes and portfolios). This again points at

the importance of active learning in the field of statistics education. Prior studies (Dahleez et al., 2021; Bonk & Zhang, 2008; Delialioglu & Yildirim, 2007; Kyei-Blankson & Ntuli, 2016) have all indicated that the interactive learning spaces bring out the motivation, collaboration and conceptualization. This research has demonstrated that interactive learning is not only able to make engagement more effective but also enable more leverage of assessment instruments. Importantly, interactivity is not just a pedagogical option, but a professional imperative: student teachers who are immersed in an interactive learning experience will be more likely to pass it on to their students in the future, thereby increasing the pool effect on the educational system as a whole.

In total, the findings lead to a few implications. On the one hand, instructional or assessment practice cannot be wholly responsible for participation in educational statistics. Conversely, the best ones are integrative in the sense that they combine the structured mode of delivery with the active-reflective practices. Second, these findings recommend a pedagogical reform of the Cameroonian colleges of teacher training, an area dominated by traditional pedagogy. Also, quizzes and portfolios can be integrated into interactive learning structures to produce more balanced and exciting learning environments. Finally, the study highlights the importance of context: while the international literature suggests the potential of such strategies, their success in Cameroon is mediated through cultural expectations, institutional constraints and resource availability. This study therefore suggested that future research should take an intersectional approach from the viewpoint of how these factors influence the translation of pedagogical strategies into the outcomes measured in engagement.

CONCLUSION

From the findings, it seems important to incorporate quizzes, portfolio, and interactivity in the teacher's instructional and assessment procedures. A more important focus is the integration of the above strategies in various ways to make them more effective. Consider using quizzes as a way to moderate the effects of DI on student engagement in terms of Teacher Engagement, with remediation.

Further research should be conducted in larger sample sizes and with a broader sample base in order to improve the generalizability of the results. In addition, studies should be conducted to investigate the influence of other methods of teaching and evaluating on student teachers' involvement in Educational Statistics. Statistics can also be carried out on EDU Statistical Student Teacher Engagement in Cameroonian Classrooms to investigate the role of culture on effective Student Teacher Engagement. In addition, I can work on Educational Statistics paper on how the classroom environment and resources impact Student Teacher Engagement. Finally, it can be researched how technology-mediated instructional and assessment strategies affect Student Teacher Engagement in Educational Statistics.

REFERENCES

- Adedeji, S. O., & Olaniyan, O. (2011). *Improving the conditions of teachers and teaching in rural schools across African countries* (pp. 1-89). Addis Ababa: Unesco-licba.
- Barrett, H. (2005, December). *White paper: Researching electronic portfolios and learner engagement*.
- Bergmark, U., & Westman, S. (2018). Student participation within teacher education: emphasising democratic values, engagement and learning for a future profession. *Higher Education Research & Development*, 37(7), 1352-1365. <http://dx.doi.org/10.1080/07294360.2018.1484708>

- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: principles, policy & practice*, 5(1), 7-74. <https://doi.org/10.1080/0969595980050102>
- Bonk, C. J., & Zhang, K. (2008). *Empowering online learning: 100+ activities for reading, reflecting, displaying, and doing*. John Wiley & Sons.
- Chen, M. R. A., Hwang, G. J., & Chang, Y. Y. (2019). A reflective thinking-promoting approach to enhancing graduate students' flipped learning engagement, participation behaviors, reflective thinking and project learning outcomes. *British Journal of Educational Technology*, 50(5), 2288-2307. <http://dx.doi.org/10.1111/bjet.12823>
- Cinches, M. F. C., Russell, R. L. V., Chavez, J. C., & Ortiz, R. O. (2017). Student engagement: Defining teacher effectiveness and teacher engagement. *Journal of Institutional Research South East Asia*, 15(1).
- Dahleez, K. A., El-Saleh, A. A., Al Alawi, A. M., & Abdelmunim Abdelfattah, F. (2021). Higher education student engagement in times of pandemic: the role of e-learning system usability and teacher behavior. *International Journal of Educational Management*, 35(6), 1312-1329. <https://doi.org/10.1108/IJEM-04-2021-0120>
- Delialioglu, O., & Yildirim, Z. (2007). Students' perceptions on effective dimensions of interactive learning in a blended learning environment. *Journal of Educational Technology & Society*, 10(2), 133-146. <https://hdl.handle.net/11511/52265>
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, 74(1), 59-109. <https://doi.org/10.3102/00346543074001059>
- Harris, D. N., & Sass, T. R. (2011). Teacher training, teacher quality and student achievement. *Journal of public economics*, 95(7-8), 798-812. <https://doi.org/10.1016/j.jpubeco.2010.11.009>
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
- Human-Vogel, S., & Dippenaar, H. (2013). Exploring pre-service student-teachers' commitment to community engagement in the second year of training. *Higher Education Research & Development*, 32(2), 188-200. <http://dx.doi.org/10.1080/07294360.2012.678307>
- Iqbal, S., & Ali, A. (2024). Education and professional development: Opportunities and challenges for in-service teachers: a review. *Gomal University Journal of Research*, 40(1), 117-133. <http://dx.doi.org/10.51380/gujr-40-01-10>
- Kamps, D., Wills, H. P., Heitzman-Powell, L., Laylin, J., Szoke, C., Petrillo, T., & Culey, A. (2019). The effects of direct instruction on the reading outcomes of diverse learners: A meta-analysis. *Journal of Learning Disabilities*, 52(1), 3-18. <http://dx.doi.org/10.3390/bs13010023>
- Kamran, F., Kanwal, A., Afzal, A., & Rafiq, S. (2023). Impact of interactive teaching methods on students learning outcomes at university level. *Journal of Positive School Psychology*, 7(7), 89-105.
- Kuchah, K. (2013). *Context-appropriate ELT pedagogy: An investigation in Cameroonian primary schools* (Doctoral dissertation, University of Warwick).
- Kulasegaram, K., & Rangachari, P. K. (2018). Beyond "formative": assessments to enrich student learning. *Advances in physiology education*, 42(1), 5-14.

- Kulasegaram, K., & Rangachari, P. K. (2018). Beyond “formative”: assessments to enrich student learning. *Advances in physiology education*, 42(1), 5-14. <http://dx.doi.org/10.1152/advan.00122.2017>
- Kyei-Blankson, S., & Ntuli, J. (2016). The role of interactivity in student engagement in online learning environments. *International Journal of Information and Learning Technology*, 33(5), 336-348. <http://dx.doi.org/10.22158/wjer.v3n1p48>
- Leslie, H. J. (2020). Trifecta of student engagement: A framework for an online teaching professional development course for faculty in higher education. *Journal of Research in Innovative Teaching & Learning*, 13(2), 149-173. <http://dx.doi.org/10.1108/JRIT-10-2018-0024>
- Li, J., & Wang, X. (2019). Portfolio-based assessment and learner engagement in STEM education: A case study of middle school students. *Journal of Educational Technology Development and Exchange*, 12(1), 1-16. <https://doi.org/10.18785/jetde.1201.01>
- Marzano, R. J. (2007). *The art and science of teaching: A comprehensive framework for effective instruction*. ASCD.
- Meihami, H., & Esfandiari, R. (2021). Exploring EFL teachers’ professional identity development in a CALL teacher preparation program. *The JALT CALL Journal*, 17(2), 135-157. <https://doi.org/10.29140/jaltcall.v17n2.404>
- Mekolle, P. M. (2024). Management approach to leadership and teachers commitment in secondary schools in Kupe-Muanenguba Division, South West Region of Cameroon. *European Journal of Educational Management*, 7(4), 245-263. <http://dx.doi.org/10.12973/eujem.7.4.245>
- Nadeem, M., Oroszlanyova, M., & Farag, W. (2023). Effect of digital game-based learning on student engagement and motivation. *Computers*, 12(9), 177. <https://doi.org/10.3390/computers12090177>
- Nkwenti, M. F., & Fokum, B. E. (2018). The importance of educational statistics in teacher training in Cameroon: An overview. *Journal of Education and Practice*, 9(26), 109-116. <http://dx.doi.org/10.35293/esi.24>
- Obena, A. I. (2021). Leadership practices and strategies to resolve teachers’ challenges in Cameroon secondary schools. *International Journal of Research publication*, 78(1), 18-36. <http://dx.doi.org/10.47119/IJRP100781620211986>
- O'Sullivan, L., & Taylor, T. (2018). Using portfolios to foster student engagement in higher education. *Journal of Further and Higher Education*, 42(10), 1350-1361.
- Powell, S. J., Stevens, E. A., & Miller, K. R. (2017). Direct instruction: A framework for enhancing student engagement. *Preventing School Failure: Alternative Education for Children and Youth*, 61(2), 107-114. <http://dx.doi.org/10.1080/1045988X.2016.1261078>
- Rosenshine, B. (2012). Principles of instruction: Research-based strategies that all teachers should know. *American Educator*, 36(1), 12-19.
- Rostami, F., & Talebinejad, M. (2018). The effect of portfolio assessment on learner engagement and achievement in EFL writing classes. *Journal of Language Teaching and Research*, 9(4), 785-795. <http://dx.doi.org/10.5539/elt.v5n5p138>

- Schwille, J., Dembélé, M., & Schubert, J. (2007). Global Perspectives on Teacher Learning: Improving Policy and Practice. *International Institute for Educational Planning (IIEP) UNESCO*.
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of educational psychology*, 85(4), 571. <https://psycnet.apa.org/doi/10.1037/0022-0663.85.4.571>
- Smith, J., Johnson, R., & Brown, L. (2015). The impact of quizzes on student engagement: A meta-analysis. *Journal of Educational Psychology*, 107(3), 717–730.
- Williams, K., & Chinn, C. (2017). The benefits and challenges of electronic portfolios for student engagement. *Journal of Educational Technology & Society*, 20(2), 197–208. <http://dx.doi.org/10.21432/T23W31>
- Zhang, M. (2021). EFL/ESL teacher's resilience, academic buoyancy, care, and their impact on students' engagement: A theoretical review. *Frontiers in psychology*, 12, 731859. <https://doi.org/10.3389/fpsyg.2021.731859>
- Zhao, Y., Zhao, M., & Shi, F. (2024). Integrating moral education and educational information technology: A strategic approach to enhance rural teacher training in universities. *Journal of the Knowledge Economy*, 15(3), 15053–15093. <http://dx.doi.org/10.1007/s13132-023-01693-z>
- Zubizarreta, J. (2009). *The learning portfolio: Reflective practice for improving student learning*. John Wiley & Sons.